

Asst. Professor

Dr. Shah Kwok Wei

Employment History

2015 – Assistant Professor @ NUS

Deputy Program Director for B.Sc. (PFM)

新加坡国立大学助理教授、工程设备管理专业副主管

2014 – Assistant Director@Building Energy Efficiency Hub, NUS

Deputy Head @ IMRE, A*STAR

新加坡国立大学建筑能效中心助理主任

2014 – Scientist II @ IMRE, A*STAR

新加坡科技研究局材料研究工程所二级研究员

2011 – Scientist I @ IMRE, A*STAR

新加坡科技研究局材料研究工程所一级研究员

2007/2011 – Ph.D. Degree @ NUS National University Singapore

新加坡国立大学博士学位

2002/2007 – Senior Engineer @ JTC Corporation

新加坡国有裕廊集团高级工程师

1998/2002 – Electrical Engineering Degree @ Tokyo University

东京大学电气工程学位



Academic Qualifications

Ph.D. (National University of Singapore) 2007-2011

Bachelor Electrical Engineering (Tokyo University) 1998-2002

Chronological Publications

(Deputy Head, ASTAR Institute of Materials Engineering from 2013 onwards)

1) “Surface Modification of Silver Nanoparticles in Phase Change Materials for Building Energy Application”
Shah Kwok Wei et. al. (Adv. Materials Res. Vols. 622-623, 2013, pp 889, Impact Factor=NA)

(Assistant Director, National Univ. of Singapore, Building Energy Efficiency Centre, Dec 2014 onwards)

2014

2) “Aqueous Route to Facile and Functional Silica Coating of Metal Nanoparticles at Room Temperature”
Shah Kwok Wei et. al. (Nanoscale 2014, 6, 19, 11273, DOI:10.1039/C4NR03306J, Impact Factor=7.367)

3) “Optimized Production of Copper Nanostructures with High Yields for Efficient Use as Thermal Conductivity-Enhancing PCM Dopant” **Shah Kwok Wei** et. al. (Co-first Author) (Journal of Materials Chemistry A, 2014, Vol. 2, Pg. 3417-3423, DOI: 10.1039/C3TA14550F, Impact Factor=8.867)

4) “Synthesis and multiple reuse of eccentric Au@TiO₂ nanostructures as catalysts” ZW Seh, SH Liu, SY Zhang, **Shah Kwok Wei** and MY Han (Chemical Communications, 2011, 47, 6689, Impact Factor=6.718)

- 5) "Anisotropic Growth of Titania onto Various Gold Nanostructures: Synthesis, Theoretical Understanding, and Optimization for Catalysis". Seh ZW, Liu SH, Zhang SY, Bharathi M. S., Ramanarayan H., Low M., **Shah Kwok Wei**, Zhang Y.W., Han MY (Angewandte Chemie 2011, 123, 10322, Impact Factor=13.734)
- 6) "Composite Metal-Oxide Nanocatalysts" LIU SH, BAI SQ, ZHENG YG, **SHAH Kwok Wei**, HAN MY (ChemCatChem, 2012, 4, 1462-1484, Impact Factor=5.044)
- 7) "Colloidal Preparation of Monodisperse Nanocrystals" Zhang SY, Michelle D. R., **Shah Kwok Wei**, Thammanoon S., Zheng YG., Han MY*, Journal of Molecular and Engineering Materials, 2014, Vol. 02, No. 03n04, 1430001, DOI: 10.1142/S2251237314300010

2015

- 8) "Pyrrolophthalazine Dione (PPD)-based Donor-Acceptor Polymers as High Performance Electrochromic Materials", Jian Wei Xu, Qun Ye, Wei Teng Neo, Ting Ting Lin, Jing Song, Hui Zhou, Hong Yan, **Shah Kwok Wei**, Soo Jin Chua, Polymer Chemistry, 2015, 6, 1487-1494, Impact=5.368, DOI:10.1039/C4PY01608D
- 9) "Perfluoropolyether/poly(ethylene glycol) triblock copolymers with controllable self-assembly behavior for highly efficient anti-bacterial materials", Jing Song, Xiaobai Wang, Tao He, **Kwok Wei Shah**, Jianwei Xu (RSC Advances, 2015, 5, 64170-64179, Impact=3.108, DOI: 10.1039/C5RA08138F
- 10) Book Chapter on "Methods and Structures for Self-assembly of Anisotropic 1D Nanocrystals" for Editor Quan Li's book on "Anisotropic Nanomaterials - Preparation, Properties, and Applications", Shuang-Yuan Zhang, **Kwok Wei Shah** and Ming-Yong Han, E-ISBN 978-3-319-18293-3, Hardcover ISBN 978-3-319-18292-6 Publisher Springer International Publishing, 09 June 2015

(Publications since joining NUS Faculty from Aug 2015 onwards)

2015

- 11) "Rapid Copper Metallization of Textile Materials: Controlled Two-Step Route to Achieve User-Defined Patterns under Ambient Conditions", Zhang SY, Guan G, Jiang S, Guo H, Xia J, Regulacio MD, Wu M, **Shah Kwok Wei**, Dong Z, Zhang J, Han MY*. (ACS Appl Mater Interfaces. 2015 Sep 30;7(38):21545-51. DOI: 10.1021/acsami.5b06807. Impact Factor=6.7)

2016

- 12) "Time series forecasting for building energy consumption using weighted Support Vector Machine with Differential Evolution". Zhang Fan, Chirag Deb, Lee Siew Eang*, Junjing Yang, **Shah Kwok Wei**. (Energy and Buildings, 126 (2016) Pg. 94-103, Impact Factor=4.457), DOI:0.1016/j.enbuild.2016.05.028
- 13) "Evaluation of building glass performance metrics for the tropical climate" Wee Shing Koh*, Viet Phuong Bui, Huizhe Liu, Ying Ying Low, Tao Tang, Qiang Zhu, **Kwok Wei Shah**, Eiji Shidoji, Yew Meng Lim. 2016, IC2UHI2016 International Conference on Countermeasure to Urban Heat Island 2016, conference paper SUB09_FP-0010.

2017

- 14) "Evaluation of building glass performance metrics for the tropical climate". Phuong Bui, Huizhe Liu, YY Low, T Tang, Q Zhu, **Kwok Wei Shah**, Eiji Shidoji, Yew Meng Lim, Wee Shing Koh* (Energy & Building, Impact Factor=4.457, Vol. 157, Dec 2017, 195-203) DOI: 10.1016/j.enbuild.2017.01.009
- 15) "A review on time series forecasting techniques for building energy consumption" (Renewable & Sustainable Energy Reviews, 2017, Impact Factor=8.05, Chirag Deb, Fan Zhang, Yang Junjing, Lee Siew Eang*, **Shah Kwok Wei**, DOI: 10.1016/j.rser.2017.02.085, Vol. 74, July 2017, Pages 902-924
- 16) "Performance Evaluation Approach for Solar Heat Storage Systems Using Phase Change Material", Yong Wang, Xun Yang, Teng Xiong, Wenxin Li, **Shah Kwok Wei*** (Energy and Buildings, Impact Factor=4.457, Volume 155, 15 November 2017, Pages 115-127). DOI:10.1016/j.enbuild.2017.09.015
- 17) "Synthesis, Morphologies and Building Applications of Nanostructured Polymers", Lu Yong, **Kwok Wei Shah***, J.W Xu, Polymers 2017, 9(10), 506; Impact Factor=3.364, DOI:10.3390/polym9100506

18) Book chapter titled "Nanosynthesis Techniques of Silica-coated Nanomaterials" sole-authored **Shah Kwok Wei***, under book titled "Nanomaterials", ISBN 978-953-51-5896-7, Publisher: InTech, April 18th 2018, DOI: 10.5772/intechopen.74097. Downloaded 205 times.

2018

19) "Effects of POFA replaced with FA on durability properties of GBFS included alkali activated mortars" Ghasan Fahim Huseien, Mahmood Md. Tahir, Jahangir Mirza, Mohammad Ismail, **Kwok Wei Shah**, Mohammad Ali Asaad*, Construction and Building Materials, 175 (2018) 174–186, Impact Factor=3.485, 10.1016/j.conbuildmat.2018.04.166

20) "A Review on Enhancement of Phase Change Materials - A Nanomaterials Perspective", Energy and Buildings, Impact Factor=4.457, DOI: 10.1016/j.enbuild.2018.06.043, **Kwok Wei Shah***, Energy & Buildings 175 (2018) 57–68

21) "Morphology, Large Scale Synthesis and Building Applications of Copper Nanomaterials", **Shah Kwok Wei***, Lu Yong, Construction and Building Materials, Impact Factor=3.485, Vol. 180, Aug 2018, Pg 544-578, doi.org/10.1016/j.conbuildmat.2018.05.159

22) "Waste ceramic powder incorporated alkali activated mortars exposed to elevated temperatures: Performance evaluation", Ghasan Fahim Huseien, Abdul Rahman Mohd Sam, Jahangir Mirza*, Mahmood Md. Tahir Mohammad Ali Asaad, Mohammad Ismail, **Kwok Wei Shah**, Construction and Building Materials, Impact Factor=3.485, Vol 187, 30 Oct 2018, Pages 307-317, DOI: 10.1016/j.conbuildmat.2018.07.226.

23) "Impact of curing temperatures and alkaline activators on compressive strength and porosity of ternary blended geopolymer mortars", Ziyad Kubbaa, Ghasan Fahim Huseien*, Abdul Rahman Mohd Sam, **Kwok Wei Shah**, Mohammad Ali Asaad, Mohammad Ismail, Mahmood M. Tahir, Jahangir Mirza, Case Studies in Construction Materials, Vol 9, e00205, Dec 2018, DOI: 10.1016/j.cscm.2018.e00205.

2019

24) "Sustainability of nanomaterials based self-healing concrete: An all-inclusive insight", Ghasan Fahim Huseien, **Kwok Wei Shah***, Abdul Rahman Mohd Sam. Journal of Building Engineering, Vol. 23, May 2019, Pages 155-171, DOI: 10.1016/j.jobee.2019.01.032.

25) "Electroluminescent Materials: From Molecules to Polymers", MH Chua, Q Zhu, **KW Shah***, J Xu, Polymers 11 (1), 98, 2019, DOI: 10.3390/polym11010098

26) Book Chapter on "Electrochromic Smart Windows for Green Building Applications", Zheng Long, **Shah Kwok Wei***, Publisher: Royal Society of Chemistry, DOI: 10.1039/9781788016667-00494, 2019

27) Book Editor, titled "Electrochromic Smart Materials", Jian Wei Xu, Ming Hui Chua, **Shah Kwok Wei***, Publisher: Royal Society of Chemistry, ISBN-13: 978-1788011433, ISBN-10: 1788011430, 2019

28) "Evaluation of alkali-activated mortars containing high volume waste ceramic powder and fly ash replacing GBFS", Ghasan Fahim Huseien, Abdul Rahman Mohd Sam, **Kwok Wei Shah***, Jahangir Mirza*, Mahmood Md. Tahir, Construction and Building Materials 210 (2019) Pages 78–92, DOI: 10.1016/j.conbuildmat.2019.03.194

29) "Diversity of electron acceptor groups in donor–acceptor type electrochromic conjugated polymers", Ming Hui Chua, Qiang Zhu, Tao Tang, **Kwok Wei Shah***, Jianwei Xu, Solar Energy Materials and Solar Cells, Vol. 197, 1 Aug 2019, Pages 32-75, DOI: 10.1016/j.solmat.2019.04.002

30) "Solution-Based Synthesis and Processing of Metal Chalcogenides for Thermoelectric Applications", **Kwok Wei Shah***, Su-Xi Wang, Yun Zheng, Jianwei Xu, DOI:10.3390/app9071511, Applied Sciences, 2019, 9(7), 1511

31) "One-Dimensional Nanostructure Engineering of Conducting Polymers for Thermoelectric Applications", **Kwok Wei Shah***, Su-Xi Wang, Yun Zheng, Jianwei Xu, Applied Sciences 2019, 9(7), 1422; DOI: 10.3390/app9071422

32) Invited Book Editor, titled "Nanocrystals", **Shah Kwok Wei***, Publisher: Intech, In preparation

33) Invited Paper, "Polymer for Buildings", **Shah Kwok Wei***, Journal "Polymers", In preparation

- 34) Pending “Investigation of the melting process of nanoparticle-enhanced PCM inside a latent heat storage unit using a helical coil heat exchanger”, Applied Thermal Engineering, Yong Wang, Teng Xiong, Wenxin Li, Xun Yang, **Kwok Wei Shah**, Ruiqing Du, Submitted
- 35) Pending “Review on nano-enhanced phase change materials (NEPCMs) - A numerical perspective”, **Shah Kwok Wei***, Xiong Teng, Construction and Building Materials, Submitted
- 36) Pending “Ultrafast Microwave-assisted Nanohexagonal Gold Nanoparticles”, Chemical Communications Letters, **Shah Kwok Wei***, Zheng Long, Submitted
- 37) Pending “Hollow Amorphous Co(OH)₂ Mesoporous Microspheres with Nanosheets Supported PdCu Nanoparticles for Efficient Hydrogen Evolution Electrocatalysis” Applied Catalyst B, Shaoqing Liu; Jinqi Xie; Shuwen Wu; Yanwu Zhu; **Kwok Wei Shah**; Xianzhu Fu; Rong Sun; Chingping Wong

Honors and Awards

- JTC Corporation **Overseas Scholarship Award** 1998 to (Tokyo University, Japan)
新加坡国有裕廊集团海外奖学金（日本东京大学）
- ASTAR **PhD Graduate Scholarship Award** 2005 to (National University of Singapore)
新加坡科技研究局奖学金（新加坡国立大学）
- Double Award Winner @ Startup Asia **2014 (Most Attractive for Investment & Promising Idea Award)**
2014 年度亚洲创业颁发“最有前景技术”“最有潜质技术”双料奖
- Double Top-5 Award “**Highly-Commended**” Winner @ “**The IET Innovations Awards 2014**” UK London
(for both Built-Environment Category & Startup Category)
2014 年度英国伦敦国际工程师协会颁发的“建筑环境类”，“创业类”双料最佳前 5 奖
- Winner of Institution of Engineers (IES) SG, “**IES Prestigious Engineering Achievement Awards 2015**”
2015 年度新加坡工程师协会颁发的“2015 年度杰出工程成就奖”
- Winner of BCA-SGBC Green Building Individual Awards “**Young Green Innovator of the Year 2015**”
2015 年度新加坡建筑局与绿色建筑协会颁发的绿色建筑个人奖项
2015 年度杰出青年绿色创新奖”
- Winner of Asia Green Future Leadership Awards “**Green Leadership Award 2017**” organized by CMO Asia at scheduled on 2nd August 2017 at Le Meridien Singapore, Sentosa.
2017 年度国际 CMO Asia 颁发的国际绿色杰出领导个人奖项“2017 年度青年绿色杰出领导奖”
- Supervisor for Hwa Chong Junior College students who won Silver award at Singapore Science & Engineering Fair (SSEF 2018) is a national competition organised by the Ministry of Education (MOE)
- Winner of “**50 Most Impactful Smart Cities Leaders 2018**”, organized by World CSR on 17th & 18th Feb, 2018, endorsed by Paloma Durán, Director, United Nations Sustainable Development Goals Fund
2018 年度国际 World CSR 与 UN-SDG 联合国持续发展基金颁发的国际 50 最有影响力的智能城市_杰出领导者个人奖项“2018 年度最有影响力的智能城市杰出领导奖”
- Nominee to **U21 Early Career Researcher Workshop** in **Shanghai Jiao Tong University, China**, on **9-12 October 2018**, based on the theme “Sustainable Futures” by SDE, NUS Global Relations Office

Conference Chair and Invited Guest Speaker

- MND’s Urban Sustainability R&D Congress, Singapore 2013
- International Green Building Conference (IGBC), Singapore 2013
- International Conference on Materials for Advanced Technologies (ICMAT), Singapore 2013

- Green Talk on 'Achieving High Performance Green Building' in Penang, organized by Real Estate and Housing Developers' Association (REHDA) of Malaysia 2013
- Green Talk on 'Designing and Developing Green Buildings' in Sabah, organized by Sabah Housing and Real Estate Developers' Association (SHAREDA) of Malaysia 2013
- IMRE - NANOTEC Joint Workshop on Green Nanotechnology, Singapore 2013
- Invited poster presentation in CHI-Nano Conference & Expo in Nanopolis Suzhou, China 2013
- Chairing Organizer for AIT-ERIAN-IMRE "Green Building Envelopes and Materials Workshop", SG 2013
- Invited lecturer on "Green Building Design for Tropics" for "GreenRE Manager Course" Kuala Lumpur, Malaysia, March 1st Intake & June 2nd Intake & September 3rd Intake, Student Intake 2014
- 3rd Annual World Congress of Advanced Materials-2014 (WCAM-2014), Chongqing China 2014
- Selected Double Top-5 Finalist for The IET Innovation Awards 2014, London UK 2014
- Conference Chair for WITS Forum 2014 (Water Innovation Technologies and Solutions 2014) with American Chemistry Society and Singapore National Institute of Chemistry, Singapore 2014
- Invited to Solar Shadings Seminar, European Solar Shading Organization, Germany Stuttgart 2015
- Invited speaker for "The Forum of Green Building Technology in Hot Summer and Warm Winter Area" by China Green Building Council CGBC held on 3-4 Dec at Guangxi, China 2015
- Co-organized a "Special Workshop on Energy Simulation, Analytics and Energy Forecasting of Institutional Buildings" at "The 9th International Symposium on Heating, Ventilation and Air-conditioning and the 3rd International Conference on Building Energy and Environment, July 12th to 15th 2015, Tianjin", Mattheos Santamouris, Siew Eang Lee, Shah Kwok Wei
- Invited external reviewer for MOE research proposal titled "Eco-friendly Sandwich Panel for Sound Damping in Electro-mechanical Systems", submitted in response to the Singapore Ministry of Education MOE Translational R&D and Innovation Fund grant call. The evaluation was submitted on 16 Sept 2016.
- Invited distinguished guest speaker during the GreenRE Manager & MyCREST Qualified Professional Dual Certification Course in Wisma REHDA, Malaysia, on 11 November 2016. He covered the topic: Passive Colling for Green Building Design in the Tropics.
- Invited as one of the distinguished panel of judges during the Assessment Day of GreenRE Manager & MyCREST Qualified Professional Dual Certification Course in Wisma REHDA, Malaysia, on 26 Nov 2016.
- Invited Guest Lecturer and Guest Examiner for the Green Building Advance Training course 7th Dec 2016 by the Vietnam Green Building Council. He lectured on the topic "Passive Design Strategies, Nanomaterials and Nanotechnology for Green Buildings in Tropics" on 7 December 2016."
- Invited Guest Speaker and Discussion Panelist at the **Skyscrapers Asia Summit 2017** on 21st–24th February 2017 in Hotel Furama Singapore.
- Invited Speaker for **Retirement Living Asia Summit 2017** held from 18-21 July 2017 in Kuching Malaysia
- Invited Guest Panelist Speaker for **Tech X Asia Digital Disruption Digital Transformation**, 6 - 7 September 2017, Suntec Convention Centre, Singapore
- Invited Guest Speaker for **Retrofit Asia 2017**, 10 - 11 October 2017, Suntec Convention Centre, Singapore
- Invited Keynote Speaker by UTM University Technology Malaysia in conference. **1st Green Environmental Energy and Building Science 2017 (GEEBS)** Research Group International Conference 2017. 16th to 17th October 2017, at the Convention Hall, Block B12 Faculty of Built Environment, Universiti Teknologi Malaysia, Skudai, Johor.

•Invited Speaker at International Construction Week (ICW) 2018 (26 - 30 March 2018) at Kuala Lumpur Convention Centre (KLCC). ICW 2018. Topic on “The Fourth Industrial Revolution, and its Impact for the Construction Industry”. International Construction Transformation Conference: Achieving Peak Productivity Through Technology and Innovation on 26-27 March 2018 at the Kuala Lumpur Convention Centre (KLCC)

Professional Appointments / Membership

- 1) Invited member of the SPRING’s Technical Committee for Surface Coatings 2014-2017
新加坡标新局 “表面涂层” 课题组特邀成员 (2014-2017)
- 2) Invited member of Singapore Green Building Council SGBC's Technical Committee Task Force for Facade and Roofing 2013-2015.
新加坡绿色建筑协会科技委员会 “楼宇幕墙与屋顶” 课题特别小组成员 (2013-2015)
- 3) Invited member of the Scientific Committee for Singapore Junior Chemistry Olympiad, 2012-2013.
新加坡化学奥林匹克竞赛科技委员会特邀成员 (2012-2013)
- 4) Invited member of the SPRING’s Technical Review Committee for Singapore’s Code of Practice CP 31 (now SS 535 - Mains Failure Standby Generating Systems) and CP 16 (now SS 551 - Earthing). (Code of Practice CP is now replaced by Singapore Standards SS) (2007 & 2017)
新加坡标新局规范 SS535 科技评审组特邀成员 (2007 & 2017)
- 5) Invited Reviewer for high-impact peer-reviewed Journal “Energy and Buildings” (2015 and 2016, 2 yrs)
期刊《Energy and Buildings》特邀评审 (2015-2016)
- 6) Invited Technical Consultant in Ascendas Group Smart Park Tender Review Panel (9 Dec 2015)
星桥腾飞集团职能科技园招投标评审组特邀科技顾问
- 7) Invited Ambassador under BCA Industry Ambassadors Programme (24 Dec 2015, 3 yrs, 2016-2019)
新加坡住建局企业界大使项目特邀大使 (2016-2019)
- 8) Invited as Overseas Distinguished Visiting Professor at Tianjin Univ. of Technology (1 Feb, 2016-18)
天津理工大学海外杰出客座教授 (2016-2018)
- 9) Appointed Deputy Programme Director, Dept of Building, for B.Sc. Programme under NUS, Dept of Building, Project and Facilities Management, (1st July 2016)
新加坡国立大学建筑系工程设备管理专业副主任 (2016)
- 10) Invited member of Real Estate and Housing Developers’ Association (REDHA Malaysia) GreenRE Technical Taskforce Committee and Representative for “Passive Cooling for Green Building Design in the Tropics” (22nd Jan, 2014-2016, 2 years + 1 Jul 2016 to 30 Jun 2018, 2 years).
马来西亚房地产开发协会旗下绿色建筑可持续协会 “热带绿色建筑设计无动力制冷” 课题委员会特邀成员 (2016)
- 11) Invited Proposal Reviewer for MOE Research Grant proposals (2016)
新加坡教育部研究项目特邀评审 (2016)
- 12) Invited as Advisory Board Member of Vietnam Green Building Council VGBC (1st Jan 2017, 1 year)
- 13) Invited as Member of Education Committee of Vietnam Green Building Council (1st Jan 2017, 1 year)
越南绿色建筑协会及其教育委员会特邀顾问组成员
- 14) Serves as Chief Technical Advisor for Bronx Culture Pte Ltd (2017-2018)
Bronx Culture 公司首席科技顾问 (2017-2018)
- 15) Serves as Technical Consultant for NIPO Pte Ltd (2017-2018)

NIPO 公司科技顾问 (2017-2018)

- 16) Invited committee member of SPRING's Working Group for Singapore Standards SS535 (Code of practice for installation, operation, maintenance, performance and construction requirements of mains failure standby generating systems – formerly CP 31) in 2017
- 17) Invited committee member of SPRING's Energy Efficiency Coatings Pro Tem Committee (2017)
- 18) Serves as Chief Technical Advisor for Ronser Biotech Sdn Bhd Malaysia (2018)
- 19) External PhD Co-supervisor for Miss Nurul Humaira Binti Muhd. Zaimi of Assoc Prof Dr. Hasimah Binti Abdul Rahman of Faculty of Electrical Engineering, UTM Universiti Teknologi Malaysia (2018-2021)

Patents Filed

- 1) *"Mega Floating Offshore Fuel Storage Facility"* by **Shah Kwok Wei**, NUS, JTC and MPA. (PCT Patent WO2009131543, Patent Application No. PCT/SG2008/000138 SG, UAE, CN, JPN)
- 2) *"Method of Forming A Polymer Substrate with Variable Refractive Index Sensitivity"* by **Shah Kwok Wei**, XD Su, HY Low, S J Chua. (US2013/0295325-A1, Patent App 201205611-5, ID No. 201106)
- 3) *"A Method for Preparing A Surface Enhanced Raman Spectroscopy Particle"* **Shah Kwok Wei**, Liu Shuhua, Michelle Low, Seh Zhiwei and Han MY (US 20130196057 A1, 201205611-6, IMRE ID No. 201105)
- 4) *"High-Yield Green Synthesis of Copper Nanostructures Using Reusable Reaction Medium and Their Thermal Conductivity Enhancement of Phase Change Material"* **Shah Kwok Wei**, Thammanoon S, Ye Enyi, Zhang Shuang-Yuan, Han Ming-Yong. (SG Patent App 201304943-2, Patent PCT/SG2014/000308, IMRE ID 201250, International Filing Date: 26 June 2014)
- 5) *"Multifunctional Rotatable Outdoor Climatic Test-Chamber with Interchangeable Façade and Shading Subjects"* **Shah Kwok Wei**, Zhang SY, Tham S., Han MY (SG Patent No. 201303606-6, IMRE ID No. 201255)
(b) Actual Filing Date: 9 May 2013
- 6) *"Co-microencapsulation of phase change and thermal conductive materials"* Shah Kwok Wei, Thammanoon Sreethawong, Zhang SY, Han MY (SG Patent No. 10201402141X, IMRE ID No 201414)
- 7) *"A Simple, Effective, and Low-Cost Aqueous Approach for Silica-Coating on Metal and Metal Oxide Nanoparticles"*, **Shah Kwok Wei**, Thammanoon Sreethawong, Liu Shuhua, Zhang Shuang-Yuan, Lim Suo Hon, Ang Kian Seng, Tan Li Sirh, and Han MY, (SG Patent App. 10201404279P, IMRE ID No. 201352) (a) Application No: 10201404279P (b) Actual Filing Date: 21 July 2014 (c) Priority Date: 21 July 2014
- 8) *"Dicobalt Phosphide Nanostructures as Water Splitting Electrocatalyst"*. Inventors: (1)ZHANG Shuang-Yuan (2)TEE Si Yin (3) HAN Ming-Yong (4) **SHAH Kwok Wei** (5) CHUA Chin Sheng (6) CHI Dongzhi (7) Andy HOR. (a) SG Patent Application No. 10201505483T (b) Actual Filing Date: 13 July 2015 (c) ETPL ref: IMR/P/09019/00/SG (d) IMRE ID No. 201494
- 9) *"Photocatalytic Self-Cleaning and UV-IR-Filtering Nanocoatings for Glass Façade Panels and Window Systems"*. Inventors are (1) **SHAH Kwok Wei** (2) ZHU Qiang (3) HAN Ming Yong (4) TANG Tao (5) LOW Ying Ying Lesley (6) YOW Kenneth Li Hsien (7) YOW Cheng Hoe. This SG patent application has been filed on 24 Dec 2015. The filing details are as follows: (a) SG Patent Application No: 10201510662P (b) Actual Filing Date: 24 Dec 2015 (c) ETPL ref: IMR/P/09152/00/SG (d) IMRE ref: 2015010
- 10) *"Method for Ultra-fast Electroless Copper Plating with Patterns and Electroless Copper Plating Solutions for making the same"* Zhang Shuang-Yuan, **Shah Kwok Wei**, Guo Hong Chen, Michelle Dela Cruz Regulacio, Zhang Jie, Han Ming Yong Han Ming Yong The filing details are as follows: (a) SG Patent Application No: 10201500865T Filed 4 Feb 2015. Also *"A Process For Plating A Metal On A Textile Fiber"* PCT/SG2016/050061, PCT filed 4th Feb 2016 (b) Filing Date: SG filed on 4 Feb 2015 & PCT filed on 4 Feb 2016 (c) ETPL ref: IMRE/Z/08764 (d) IMRE ID No. 2014048)
- 11) *"Novel cementitious composite material using high thermal-conductive nanowires-doped microencapsulated PCM in concrete with multi-functional (heat absorptive and heat insulative) thermal"*

properties for solar-heat reduction". Inventors are (1) **SHAH Kwok Wei** (2) TANG Tao (3) ZHU Qiang (4) HAN Ming Yong (5) LOW Ying Ying Lesley (6) SUN Lai Fong (Sun Fong Trading Pte Ltd). This SG patent application has been filed on 28 April 2016. The filing details are as follows: (a) SG Patent Application No: 10201603387S (b) Actual Filing Date: 28 April 2016 (c) ETPL ref: IMR/Z/09153 (d) IMRE ref: 2015011

12) "A Method for Preparing Metal Phosphide". Inventors: (1) ZHANG Shuang-Yuan (2) TEE Si Yin (3) HAN Ming-Yong (4) **SHAH Kwok Wei** (5) CHUA Chin Sheng (6) CHI Dongzhi (7) Andy HOR. This USA Patent Application has been filed. Filing details are as follows: (a) Application No: 15/209,618 (b) Actual Filing Date: 13 July 2016 (c) Priority Date: 13 July 2015 (c) ETPL ref: IMR/P/09019/02/US (d) IMRE ref: 201494

13) "Photocatalytic Self-Cleaning And UV-IR-Filtering Nanocoatings For Glass Façade Panels And Window Systems" **Inventor(s):** (1) SHAH Kwok Wei (2) ZHU Qiang (3) HAN Ming Yong (4) TANG Tao (5) LOW Ying Ying Lesley (6) YOW Kenneth Li Hsien (7) YOW Cheng Hoe. Filing Details are: (a) Application **No. PCT/SG2016/050614** (b) **ETPL Ref:** IMR/P/09152/01/PCT, (c) **IMR Ref:** 2015010 (d) filed on 23 Dec 2016

14) "Silica Coating on Nanoparticles" Inventor(s): 1. Thammanoon Sreethawong 2. Shah Kwok Wei 3. LIU Shuhua 4. ZHANG Shuang-Yuan 5. LIM Suo Hon 6. ANG Kian Seng (BCA) 7. TAN Li Sirh (BCA) 8. HAN Ming Yong, United States of America Patent Application No. 15/327,577, ETPL Ref: IMR/P/08286/03/US, IMRE Ref: 201352

name(s) of staff	title(s) of inventions/patents	Year	Any other remarks/info Granted US Patents only. Excludes Singapore patents https://patents.justia.com/inventor/kwok-wei-shah
Shah Kwok Wei & A*STAR inventors	Method for preparing transition metal phosphide	2017	Granted by the United States Patent and Trademark Office (USPTO) Patent number: 9802821 Filed: July 13, 2016 Date of Patent: October 31, 2017 Assignee: Agency for Science, Technology and Research
Shah Kwok Wei & A*STAR inventors	Silica coating on nanoparticles	2017	Granted by the United States Patent and Trademark Office (USPTO) Publication number: 20170173550 Filed: July 21, 2015 Publication date: June 22, 2017 Applicant: Agency For Science, Technology and Research
Shah Kwok Wei & A*STAR inventors	Method for preparing transition metal phosphide	2017	Granted by the United States Patent and Trademark Office (USPTO) Publication number: 20170015558 Filed: July 13, 2016 Publication date: January 19, 2017
Shah Kwok Wei & A*STAR inventors	Method of forming a polymer substrate with variable refractive index sensitivity	2015	Granted by the United States Patent and Trademark Office (USPTO) Patent number: 9011705 Filed: July 26, 2012 Date of Patent: April 21, 2015 Assignee: Agency for Science, Technology and Research
Shah Kwok Wei & A*STAR inventors	Method for forming a polymer substrate with variable refractive index sensitivity	2013	Granted by the United States Patent and Trademark Office (USPTO) Publication number: 20130295325 Filed: July 26, 2012 Publication date: November 7, 2013
Shah Kwok Wei & A*STAR inventors	Method for preparing a surface enhanced Raman spectroscopy particle	2013	Granted by the United States Patent and Trademark Office (USPTO) Publication number: 20130196057 Filed: July 30, 2012 Publication date: August 1, 2013

Project Awards

1) Co-Principal Investigator, awarded ASTAR-MND Green Building Grant Call, "Development and Testbedding of Nanostructured Phase Change Materials in Window Blinds for Glazed Buildings in Tropical Climate", 3 years, 2011

2) Principal Investigator, for SOMFY Pte Ltd (France), French MNC Company on "Development and Optimization of Energy-Saving High-Performance Automated Solar Shading Designed for Use in hot and humid Tropical Climate" 2012

- 3) Principal Investigator, for LME Pte Ltd (SG), "Photocatalytic Self-Cleaning and UV-IR Filtering Nanocoatings for Glass Façade Panels and Windows Systems for Tropical Green Buildings" 2013
- 4) Commercial licensing a patent on "Multifunctional Rotatable Outdoor Climatic Test-Chamber with Interchangeable Façade and Shading Subjects" (Patent App. 201303606-6) to Nanoflux Pte Ltd (SG) 2013
- 5) Principal Investigator for Exploit Technologies Pte Ltd (SG) on "M-KOOL - Smart Fabric for Cool Wearable" for "Next-to-the-Skin" Exhibition @ Startup Asia Singapore 2014 (**Winner of "Most Promising Idea Award" and "Most Attractive for Investment Award"**, featured on Straits Times, ZaoBao, TODAY, Channel News Asia, and 93.8 Live on 8 & 9 May 2014)
- 6) Principal Investigator for Kibing Group (China), on "Tech Roadmap for High Value Added Glass", 2014
- 7) Principal Investigator for Sunhuan Pte Ltd (SG) on "Nanostructured phase change materials in concrete-based construction materials for passive-cooling and green building applications", 2014
- 8) Principal Investigator for The Coca-Cola Company, TCCC (USA) on "High Efficiency Phase Change Materials Based On R744 Condenser For Tropical Weather", 12 mths, Phase 1 Materials Selection, 2014
- 9) **Highly-Commended Top-5 Finalist** for The IET Innovation Awards 2014 @ London, UK (Institute of Engineering and Technology, UK), selected from over 400 entries and 30 countries for double categories – **Built Environment Category and Startup Category**.
- 10) Principal Investigator for Aeris Dynamics Pte Ltd (SG), "Development of Cold Chain Solutions with Vacuum Insulated Panel and Phase Change Material technologies", 2 years, 2015
- 11) Co-Principal Investigator for SG-China Joint Research Grant Call, "Eco-Smart City: Development of Sensors and Sensing Networks for Environment, Climate and Energy Efficiency", by A*STAR and MOST Ministry of Science and Technology of the People's Republic of China, Start 20 Jan 2015, 3 yrs
- 12) Principal Investigator for The Coca-Cola Company, TCCC (USA) on "High Efficiency Phase Change Materials Based On R744 Condenser For Tropical Weather", 12 months, Phase 2 Prototyping, 2015
- 13) Co-Principal Investigator for NRF POC Grant "CoSYcloud™, Nanostructured Phase-Change Technology in a Portable Infant Warming System for the Surgical/Critical Care Setting", S\$250k, 22nd Nov 2015, 18 mths, NRF2015NRF-POC001-025,
- 14) Co-Principle Investigator for Groomwerkz Pte Ltd, " "Development of Heat Transfer Mechanism, Heat Transfer Simulation Model and 'Cool' 'Clean' Car Nano-Coating for Cleaner & Greener Automotive Applications", Grant RE2016-052, (18 months), S\$120k, 12 May 2016, 18 months
- 15) Principal Investigator, NUS Startup Grant, "Development of Smart Nanomaterials as "Cool" "Clean" Urban Solutions for Highly Dense Cities", \$180k, 1 August 2016, 3 years.
- 16) Principal Investigator, NUS-CDL City Development Limited Smart Green Home Project 2016-2018, "Oleophobic and antimicrobial nanocoatings using metal-based nanomaterials for smart green home applications" \$200K, 01 Dec 2016, 24 months 2016-2018
- 17) Principal Investigator, NUS-Asahi Glass Corporation, "Smart Glass Façade Derived From Advanced Nanomaterials with IoT sensors and Real-Life Test Bedding via IoT Sensored Climate Chambers and Room in Zero Energy Building", \$300k, 13 October 2017, 24 months 2017-2019

University Teaching Modules

- 1) PF2105 Research Methods. Co-lecture with fellow colleague Dr Lu Yu Jie. AY2015
- 2) PF4103/PF4501 Total Building Performance. Co-lecture with Assoc Prof Tham Kwok Wai. AY2015
- 3) BPS 5223 Building Energy Performance (Passive Systems). Co-sharing with Guest Lecturer Mr Szue Hann, Surbana-Jurong Pte Ltd AY2016
- 4) BPS5228 Advanced Building Materials and Structures. Co-sharing with Assoc Prof Kua Harn Wei AY2016
- 5) GES1019 Managing Singapore's Built Environment. Co-sharing with Assoc Prof Lee Siew Eang AY2017

Brief Introduction

石国伟教授现在就职于新加坡国立大学建筑系；也被任命为新加坡国家建设局代表大使、新加坡绿建委和标新局技术委员会的成员。同时石国伟教授也有许多海外任命：越南绿色建筑协会及其教育委员会特邀顾问组成员、天津理工大学客座教授、重庆大学客座教授、Energy and Building 期刊评审、马来西亚科技大学客座教授、马来西亚国家绿建委导师。石国伟教授也在新加坡与马来西亚几所公司担任总公司科技顾问（公司 Bronx Pte Ltd, 公司 Ronser Biotech Sdn Bdh）。

此外，石国伟教授在 2015 年获得了由新加坡工程协会颁发的 Prestigious Engineering Achievement Awards（最佳工程成就奖），以及新加坡建设局与绿建委联合颁发的 Young Green Innovator（青年绿色创新奖）。2014 年，石国伟教授获得 Startup Asia 2014 颁发的 Most Promising Idea（最具潜力概念奖）和 Most Attractive for Investment（最受投资欢迎奖）双奖得主荣誉。并且同年在英国伦敦从 30 多个国家的 400 个入围者中脱颖而出，获得英国工程技术学会 The IET Innovation Awards 2014，分别在 Built Environment（建筑环境）和 Startup（创业）等类别之下的 Highly Commended IET Innovation 2014 Awards（创新特别推荐奖 2014）双奖得主。石教授也在 2015 年度获得新加坡工程师协会 IES Singapore 颁发的（2015 年度杰出工程成就奖）。石教授也在 2015 年度新加坡政府建筑局与绿色建筑协会 BCA-SGBC 颁发的绿色建筑个人奖项（2015 年度杰出青年绿色创新奖）。石教授也在 2017 年度国际 CMO Asia International 颁发的国际绿色杰出领导个人奖项（2017 年度青年绿色杰出领导奖）。石教授将在 2018 年度被颁发国际 World CSR 与 UN-SDG 联合国持续发展基金颁发的国际 50 最有影响力的智能城市杰出领导者个人奖项（2018 年度最有影响力的智能城市杰出领导奖）。

在新加坡国立大学，石国伟教授带领着他的研究团队致力于智能纳米材料、纳米强化相变材料的研究，从合成开发到其在建筑领域的应用，同时包括基于纳米材料的热量监控、控制与管理。石国伟教授及其团队在纳米材料、纳米强化相变材料的新功能研究与开发领域有着丰富的经验，诸如：纳米材料应用于隔热玻璃、热绝缘混凝土以及其他建筑外立面材料或内墙材料当中，从而实现太阳辐射热量阻隔、热反射，热吸收，同时实现外环境噪声阻隔，墙体自清洁等功能，最终达到减少空调能耗，提升建筑能效与室内舒适度的目的，实现环境友好型建筑材料，绿色建筑与可持续性发展的目标。不仅如此，纳米材料、纳米强化相变材料还能够运用于汽车制造（热量反射涂层）、医疗领域（器官移植时器官的低温存放装置）和军事领域（含有相变材料的减弱人体热辐射的防弹衣）。

(Research) Dr Shah's research interest is in nanotechnology and nanomaterials for green building applications and energy efficiency.

(Papers & Patents) Dr Shah has first-authored papers in high-impact journals such as Nanoscale and Journal of Materials Chemistry, and co-authored 8 journal papers (Nanoscale, Impact Factor=6.739; Journal of Materials Chemistry, I.F.=6.626; Chemical Communications, I.F.=6.718; ChemCatChem, I.F.=5.044; Polymer Chemistry, I.F.=5.368, Angewandte Chemie, I.F.=13.734). So far, Dr Shah filed 7 patent applications. Presently, Dr Shah is preparing a book chapter, 1 paper and 2 patents applications.

(Principal Investigatorship) Dr Shah was awarded Principal Investigatorship for industry project by well-known MNCs such as Coca-Cola (USA), SOMFY (France) and KIBING Group (China). Locally, Dr Shah was awarded projects by Sunhuan, LME, Aeris Dynamics, Exploit Technology, and Nanoflux. Dr Shah's projects are awarded by government agencies such as Ministry of National Development MND, A*STAR and MOST Ministry of Science and Technology MOST (China).

(Awards) Dr Shah's PCM technology won multiple awards locally and overseas. Locally, Dr Shah's "M-KOOL" technology won two awards at Startup Asia 2014 for "Most Promising Idea" and "Most Attractive for Investment" Awards. Overseas, Dr Shah Kwok Wei has been selected as top-5 finalist for The IET Innovation Awards 2014 at London, UK (IET, Institute of Engineering & Technology) selected from over 400 entries from 30 countries. Dr Shah's technology was highly commended by IET judges and selected to be among the best top 5 technologies for "Built Environment" and "Startup" Category.

(Conferences) Dr Shah was invited to give talks in conferences and talks. Dr Shah was the Conference Chair for "WITS Forum 2014" (Water Innovation, Technology and Solutions 2014) organized with American Chemical Society and Singapore National Institute of Chemistry. Dr Shah was the Organizing Chair for "Green Building Envelopes and Materials Workshop 2013" with Austrian Institute of Technology and Energy Research Institute@NTU. Dr Shah is invited lecturer on "Passive Cooling for Green Building Design in the Tropics" for "GreenRE Manager's Course" in Kuala Lumpur, Malaysia

(Industry Experience) Dr Shah will bring along a wealth of industry experience to his new appointment. Dr Shah worked in the building and construction industry as senior electrical engineer in Jurong Consultants Pte Ltd and Jurong Town Corporation. Dr Shah has designed high and low-voltage systems (power, lightings, security, lightning protection, standby generation) for commercial buildings such as IBM Building in Changi Business Park, Ayer Raja Technopreneur Centre and Tembusu Power Substation.

(Technical Committees) Dr Shah has been invited to serve on multiple technical committees such as SPRING, REDHA, SGBC and SJChO (Real Estate and Housing Developers' Association, Singapore Green Building Council, Singapore Junior Chemistry Olympiad). Dr Shah is invited lecturer and representative on "Passive Cooling for Green Building Design in the Tropics" for GreenRE Manager's Course by REHDA Real Estate in Kuala Lumpur, Malaysia.

**Brief Description of Associate Professors and Assistance Professors
Appointed under the Tenure Track Scheme**

NUS, School of Design and Environment

- 1. Prof. Dr. Shah Kwok Wei**
Assistant Professor (Deputy Program Director)
Department of Building
Smart Materials Laboratory
Date joined NUS: 17 August 2015



Prof. Shah Kwok Wei is presently Assistant Professor, and Deputy Program Director under the Dept. of Building, School of Design and Environment, NUS. He is Advisory Board member of Vietnam Green Building Council and sits on VGBC Education Committee. He lectures for REHDA GreenRE in Malaysia and Visiting Fellow of University Technology of Malaysia, UTM. He is Visiting Professor at Tianjin University of Technology, China. He is appointed BCA Ambassador for 3 yrs period and a member of SPRING and SGBC technical committees. He served as Technical Consultant for Ascendas Services Pte Ltd, Chief Technical Advisor for Bronx Culture Pte Ltd.

Dr Shah' research interest is on nanotechnology and nanomaterials for green building applications. Dr Shah has done outstanding research work on a novel low-cost high-volume aqueous silica-coating technique has been granted a US Patent (US 20130196057 A1). His research paper published by Nanoscale (Nanoscale, Impact Factor=6.739, DOI:10.1039/C4NR03306J) on "Noble metal nanoparticles coated with silica by a simple process that does not employ alcohol" was highlighted by popular online science magazines such as ScienceDaily, Physorg and A*STAR website. Separately, Dr Shah's research on microencapsulated phase change materials enhanced by highly thermal conductive nanowires (Journal of Materials Chem. A, DOI: 10.1039/C3TA14550F, Impact Factor=6.626) led to the development of "M-KOOL" phase change cooling technology, which was featured on Physorg, Channel News Asia, Straits Times, Business Times, TODAY, The Star Online and Lianhe Wanbao. So far, Dr Shah's achievements include 3 first-authored papers, 9 co-authored papers, 1 book chapter, 12 patents disclosures and 1 commercial licensing.

Dr Shah has won multiple awards locally and overseas. In 2015, Dr Shah was awarded "IES Prestigious Engineering Achievement Awards 2015" by the Institution of Engineers (IES) Singapore. Again in 2015, Dr Shah was awarded "Young Green Innovator of the Year 2015" under the BCA-SGBC Green Building Individual Awards at the IGBC Conference. In 2014, Dr Shah's phase change technology won two awards at Startup Asia 2014 for "Most Promising Idea" and "Most Attractive for Investment" Awards. Again in 2014, Dr Shah Kwok Wei has been selected as top-5 finalist nomination for The IET Innovation Awards 2014 at London, UK (IET, Institute of Engineering & Technology) selected from over 400 entries from 30 countries. Dr Shah won two "Highly-Commended IET Innovation Award" for both "Built Environment" and "Startup" category. For his studies, Dr Shah won the JTC Overseas Undergraduate Scholarship to Tokyo University, and followed by A*STAR Graduate Scholarship for his PhD studies at NUS.

Prof Shah will bring along a wealth of industry experience to his new appointment. Dr Shah worked in the building and construction industry as senior electrical engineer in Jurong Consultants Pte Ltd and Jurong Town Corporation JTC. Dr Shah practiced as electrical engineer designing high and low-voltage systems (LV/HV power systems, lighting systems, security systems, lightning protection systems, standby generators, telecommunication systems) for commercial buildings such as IBM Building Phase 2 in Changi Business Park, Ayer Raja Technopreneur Centre and Tembusu Power Substation etc.

Prof Shah is often invited to serve on many public and industry technical committees. Dr Shah is currently Visiting Professor at Tianjin University of Technology. He is also appointed as BCA Ambassador by Building and Construction Authority. Dr Shah was appointed a Technical Consultant for Ascendas Pte Ltd's Smart Park Tender. Overseas, Dr Shah is invited to GreenRE Technical Committee by REHDA (Real Estate and Housing Developer's Association, Malaysia), and he conducts lectures for "GreenRE Manager Course" on "Passive Cooling for Green Building Design in the Tropics". Dr Shah previously served on SPRING's Technical Review Committee for Singapore's Code of Practice CP31 (SS535 Mains Failure Standby Generating Systems) and CP16 (SS551 Electrical Earthing), now known as Singapore Standards. Dr Shah served on scientific committee of Singapore Junior Chemistry Olympiad (SJChO 2012-2014). He was appointed to SGBC (Singapore Green Building Council) Technical Taskforce for Roofing and Facade 2013-2015 and SPRING's Technical Committee for Surface Coatings 2014-2016. Dr Shah is a member of the organizing committee for ISO/TC 229 Nanotechnologies Plenary Meeting in coming 2016. He was the Conference Chair for Conference Chair for WITS Forum 2014 (Water Innovation Technologies and Solutions 2014) with American Chemistry Society and Singapore National Institute of Chemistry, Singapore 2014. He was also the Organizing Chair for "Green Building Envelopes and Materials Workshop" with Austrian Institute of Technology and ERI@NTU in 2013.

Prof Shah is currently leading a Smart Materials Laboratory in NUS under Dept. of Building DOB, School of Design and Environment SDE, which dedicates research to next generation advanced materials for green building applications. Our focus is leverage on nanomaterials, nanotechnology and biomaterials to develop next generation smart building materials for enhanced properties and high performance such as durability, thermal conductivity, thermal insulation, sound mitigation, self-cleaning and antibacterial capabilities. Our core capabilities include large-scale nanosynthesis, nanofabrication, nanocharacterisation and test-bedding. Our research covers organic and inorganic materials with strong focus on ceramics, nanometals, nanocarbon and polymers.