Guoxing Sun 孫國星

Assistant Professor

ACADEMIC QUALIFICATIONS

- Doctor of Philosophy in Civil and Environmental Engineering, The Hong Kong University of Science and Technology, Hong Kong. (September 2010 – January 2015)
- Master of Science in Polymer Chemistry and Physics, Beijing Normal University, Beijing, China. (September 2006 – July 2009)
- Bachelor in Applied Chemistry, Beijing Normal University, Beijing, China. (September 2000 – July 2004)

PROFESSIONAL EXPERIENCE

- Assistant Professor, University of Macau, Macau. (January 2017 – present)
- Research Engineer, Group of Construction and Building Materials, The Nano and Advanced Materials Institute Limited (NAMI), Hong Kong. (September 2015 – January 2017)
- Part-time postdoctoral fellow, Department of Civil and Environmental Engineering, The Hong Kong University of Science and Technology, Hong Kong. (September 2015 – January 2017)
- Postdoctoral fellow, Department of Civil and Environmental Engineering, The Hong Kong University of Science and Technology. (March 2015 – September 2015)
- Lecturer, Zhikang Global Education and Consulting Company Limited, Tomorrow Advancing Life (TAL) Education Group, Beijing, China. (July 2009 – July 2010)
- Lecturer, Department of Food and Nutrition Engineering, Jiangsu Food & Pharmaceutical Science College, Jiangsu, China. (September 2004 – July 2006)

RESEARCH

Research Interests

- Nanoparticles fabricated from the hydration products of cement, applied to the enhancement of polymer materials such as hydrogels.
- Development of ultra-stable nanocomposite foam, applied to energy efficient, long durability and high strength foam concrete, geopolymer and gypsum.
- Concrete admixtures: superplasticizer, antifreezing agent, and foaming agent.
- Mechanical enhancement and mechanism study of polymer and fiber reinforced cementitious materials.
- Polymer crystallization, surface and interface science in polymer blends and composites.

Research Grants

- **Science and Technology Development Fund from Macau (FDCT-078/2017/A2).** "Development of Polymer-grafted Nanoparticle Foam for Light-Weight Energy Efficiency High-Performance Construction Materials". **Principal Investigator**, MOP 1,939,300, December 2017.
- **Start-up Research Fund from University of Macau, Macau (SRG2017-00094-IAPME).** "Polymer hydrogel/cement composite: internal curing, weight reduction, and mechanical enhancement". **Principal Investigator**, MOP 150,000, April 2017.

- **Qingdao Applied Basic Research Projects, Program for Youth Applied Basic Research (15-9-1-36-jch).** "Interface Modification and Mechanical Enhancement of Multi-scaled Cementitious Composites". **Principal Investigator**, CNY ¥50,000, September 2015.
- **Hong Kong Innovation and Technology Fund (ITP/077/15NP).** "Development of Ultra-stable Nano-Foam Technology for Green Building Materials". **Engineer in charge (first inventor of relevant US provisional patent)**, HKD $2,750,000, December 2015.
- **China National Basic Research (973) Program (2015CB655100)**. "Long-life Durability of Concrete Materials and Structures in Harsh Environments". **Participant**, CNY ¥38,000,000, January 2015.

Invited peer reviewer for the following journals

- Cement and Concrete Composites (Elsevier)
- Construction and Building Materials (Elsevier)
- Applied Surface Science (Elsevier)
- RSC Advances (Royal Soc Chemistry)
- Royal Society Open Science (Royal Soc Chemistry)
- Polymer (Elsevier)
- Ceramics International (Elsevier)
- Journal of Cleaner Production (Elsevier)
- Applied Energy (Elsevier)

PUBLICATIONS

Journal Papers (*Corresponding Author):

1. Zeyu Lu, Asad Hanif, Cong Lu*, **Guoxing Sun**, Yu Cheng, Zongjin Li. Thermal, mechanical, and surface properties of poly(vinyl alcohol) (PVA) polymer modified cementitious composites for sustainable development. *Journal of Applied Polymer Science*. 2018, 135, 46177.
2. Si-Yao Guo, Jian-Guo Dai*, Tie-Jun Zhao, Shuai-Dong Hou, Peng Zhang, Peng-Gang Wang and **Guoxing Sun***. A novel microporous amorphous-ZnO@TiO2/graphene ternary nanocomposite with enhanced photocatalytic activity. *RSC Advances*. 2017, 7, 36787-36792.
3. **Guoxing Sun**, Rui Liang, Zeyu Lu*, Tiansheng Shi, Ping Geng, and Zongjin Li. Remarkable mechanical enhancement achieved by interfacial strengthening of organic/inorganic/fiber composites. *Construction and Building Materials*. 2017, 142, 7-10.
4. **Guoxing Sun**, Rui Liang, Jinrui Zhang*, Zongjin Li, and Lu-Tao Weng. Mechanism of cement paste reinforced by ultra-high molecular weight polyethylene powder and thermotropic liquid crystalline copolyester fiber with enhanced mechanical properties. *Cement and Concrete Composite*. 2017, 78, 57-62.
5. **Guoxing Sun**, Rui Liang, Zeyu Lu*, Jinrui Zhang, and Zongjin Li. Mechanism of cement/carbon nanotube composites with enhanced mechanical properties achieved by interfacial strengthening. *Construction and Building Materials*. 2016, 115, 87-92.
6. **Guoxing Sun**, Zongjin Li*, Rui Liang, Lu-Tao Weng, and Lina Zhang. Super stretchable hydrogel achieved by non-aggregated spherulites with diameters < 5 nm. *Nature Communications*. 2016, 7:12095, doi: 10.1038/ncomms12095.
7. Yanguo Liu, Xiaoliang Wang, Wuming Ma, Jawayria Mujtaba, **Guoxing Sun**, Jinzhu Zhao,

Hongyu Sun*. One-pot hydrothermal synthesis of hollow Fe_3O_4 microspheres assembled with nanoparticles for lithium-ion battery anodes. *Materials Letters.* 2016, 172, 76-80.

8. Wenbin Hao, Hongyan Ma,* Zeyu Lu, **Guoxing Sun** and Zongjin Li. Design of magnesium phosphate cement based composite for high performance bipolar plate of fuel cells. *RSC Advances.* 2016, 6, 56711-56720.
9. Jawayria Mujtaba, Hongyu Sun,* Guoyong Huang, Yanyan Zhao, Hamidreza Arandiyan, **Guoxing Sun**, Shengming Xu, and Jing Zhu*. Co_9S_8 nanoparticles encapsulated in nitrogendoped mesoporous carbon networks with improved lithium storage properties. *RSC Advances.* 2016, 6, 31775-31781.
10. Zeyu Lu, Jinrui Zhang, **Guoxing Sun**, Biwan Xu, Zongjin Li*, and Chenchen Gong. Effects of the form-stable expanded perlite/paraffin composite on cement manufactured by extrusion technique. *Energy*. 2015, 82, 43-53. (Times cited: 13)
11. Jinrui Zhang, Youyuan Lu, Zeyu Lu, Chao Liu, **Guoxing Sun***, and Zongjin Li. A new smart traffic monitoring method using embedded cement-based piezoelectric sensors. *Smart Materials and Structures*. 2015, 24, 025023. (Times cited: 10)
12. Zeyu Lu, Guochang Chen, Wenbin Hao, **Guoxing Sun***, and Zongjin Li. Mechanism of UV-assisted TiO_2/reduced graphene oxide composites with variable photodegradation of methyl orange. *RSC Advances.* 2015, 5, 72916-72922.
13. Zeyu Lu, Dongshuai Hou*, Lingshi Meng, **Guoxing Sun**, Cong Lu, and Zongjin Li. Mechanism of cement paste reinforced by graphene oxide/carbon nanotubes composites with enhanced mechanical properties. *RSC Advances.* 2015, 5, 100598-100605. (Times cited: 13)
14. Xiaoliang Wang, Jawayria Mujtaba, Fang Fang, Mashkoor Ahmad, Hamidreza Arandiyan, Hongping Yang, **Guoxing Sun,** and Hongyu Sun. Constructing aligned γ-Fe_2O_3 nanorods with internal void space anchored on reduced graphene oxide nanosheets for excellent lithium storage. *RSC Advances.* 2015, 5, 91574-91580.
15. Zeyu Lu*, Biwan Xu, Jinrui Zhang*, Yu Zhu, **Guoxing Sun,** and Zongjin Li. Preparation and characterization of expanded perlite/paraffin composite as form-stable phase change material. *Solar Energy*. 2014, 108, 460-466. (Times cited: 23)
16. **Guoxing Sun**, Lu-Tao Weng, Jerold M. Schultz, and Chi-Ming Chan*. Formation of banded and non-banded poly(L-lactic acid) spherulites during crystallization of films of poly(L-lactic acid)/poly(ethylene oxide) blends. *Polymer.* 2014, 55, 1829-1836. (Times cited: 11. This paper has been downloaded or viewed 349 times only 1 month after publication, based on Article Usage Alerts from the journal.)
17. **Guoxing Sun**, Ling Wang*, Lu-Tao Weng, Jinrui Zhang, Zongjin Li*, and Guangming Chen. Determination of adsorption mechanism of polycarboxylate-ether based superplasticizers using crystallization, thermal and mass spectrometry methods. *RSC Advances.* 2014, 4, 25479-25485.
18. **Guoxing Sun,** and Chi-Ming Chan*. The effects of the low-molecular-weight component on banded spherulites of poly(L-lactic acid). *Colloid and Polymer Science.* 2013, 291, 1495-1501. (Times cited: 10)
19. Yong Lin, Kai Mo Ng, Chi-Ming Chan*, **Guoxing Sun**, and Jingshen Wu. High-impact Polystyrene/Halloysite Nanocomposites Prepared by Emulsion Polymerization Using Sodium Dodecyl Sulfate as Surfactant. *Journal of Colloid and Interface Science*. 2011, 358, 423-429. (Times cited: 48)

20. **Guoxing Sun**, Guangming Chen*, Zhengping Liu*, and Ming Chen. Preparation, crystallization, electrical conductivity and thermal stability of syndiotactic polystyrene/carbon nanotube composites. *Carbon*. 2010, 48, 1434-1440. (Times cited: 80)
21. **Guoxing Sun**, Guangming Chen*, and Zhengping Liu*. Dispersion of pristine multi-walled carbon nanotubes in common organic solvents. *Nano*. 2010, 5, 103-109. (Times cited: 11)
22. **Guoxing Sun**, Guangming Chen*, Jun Liu, Jiping Yang, Jianyun Xie, Zhengping Liu*, and Xin Li. A facile gemini surfactant-improved dispersion of carbon nanotubes in polystyrene. *Polymer*. 2009, 50, 5787-5793. (Times cited: 47)
23. **Guoxing Sun**, Guangming Chen*, and Zhengping Liu*. Progress in polystyrene/carbon nanotube composites. *Chinese Polymer Bulletin*. 2009, 2, 12-20.

Patents:

1. Zongjin Li, and **Guoxing Sun**. 纳米复合水凝胶材料及制备方法. Chinese Full Patent Application No. 201710342113.3.
2. **Guoxing Sun**. 泡沫混凝土纳米发泡剂组合物及其砌块及其制造方法. Chinese Full Patent Application No. 201710183416.5.
3. **Guoxing Sun**, Tomi Nissinen, and Ivan M.L. Sham. Foam formulation and method of preparing solid porous materials with same. 05/05/2016. US Provisional Patent Application No. 15/146921.
4. Zongjin Li, and **Guoxing Sun**. Super elastic hydrogels achieved by incorporation of "non-aggregated" 5 nm calcium hydroxide nano-spherulites. 15/04/2016. US Provisional Patent Application No. 62/390943.
5. Zongjin Li, Su Diao, Asad Hanif, Huafu Pei, and **Guoxing Sun**. Thin-walled Bowl-shaped Shell Type Floating Straight-Bladed Darrieus Vertical Axis Wind Power Generation System. 27/11/2015. US Provisional Patent Application No. 62/124429. Chinese Full Patent Application No. 201110432423.7. International Application No. PCT/CN2015/097589.

Conference Presentations:

1. **Guoxing Sun**, Rui Liang, and Zongjin Li. High-performance polymer hydrogel strengthened by cement-released nanoparticles at low-content. *EMN Orlando Meeting*, December 4-8, 2017 (Orlando, USA).
2. **Guoxing Sun**, Tomi Nissinen*, and Ivan M.L. Sham. Foam concrete: State of the art in foaming agents. *15th Concrete admixtures member representative conference*, May 6-8, 2016 (Qingdao, China).
3. **Guoxing Sun**, and Zongjin Li*. Adsorption Mechanism of Polycarboxylate-ether Based Superplasticizers on the Surfaces of $CaCO_3$, Cement, and Silica Fume. *Advanced Materials for Sustainable Infrastructure Development*, *Gordon Research Conference,* August 3-8, 2014 (Hong Kong).
4. **Guoxing Sun**, Chi-Ming Chan*, Lu-Tao Weng, and Jerold M. Schultz. Formation of Banded and Non-banded Poly(L-lactic acid) Spherulites during Crystallization of Films of Poly(L-lactic acid)/Poly(ethylene oxide) Blends. *Proceedings of the Polymer Processing Society 29th Annual Meeting ~ PPS-29 ~* July 15-19, 2013, Nuremberg (Germany).
5. **Guoxing Sun**, Guangming Chen*, and Zhengping Liu*. Preparation of Polystyrene/Carbon Nanotube Composite with Gemini Surfactant. *Polymer Annual Conference*, August 2009

(Tianjin, China).

CONTACT DETAILS

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