Guoxing Sun

Associate 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

- Associate Professor, Institute of Applied Physics and Materials Engineering, University of Macau, Macau. (September 2021 – present)
- Assistant Professor, Institute of Applied Physics and Materials Engineering, University of Macau, Macau. (January 2017 – August 2021)
- 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-006/2022/ALC).** Macao Centre for Research and Development in Advanced Materials. **Principal Investigator**, MOP 1,000,000, 2022.
- **Multi-Year Research Grant from University of Macau (MYRG-CRG2023-00009-IAPME).**

"Matrix release" of low-dosage ultra-tiny nanoparticles (LoDUT-NPs) for fabricating high-strength biocompatible hydrogels. **Principal Investigator**, MOP 1,280,000, Feb 2023.

- **Hong Kong and Macau Joint Research and Development Fund Project of Wuyi University (EF2022-00037-IAPME)**. Constructing Dynamic Network for Strong, Healable and Conductive Hydrogel and the Study on Highly Sensitive Sensor. **Principal Investigator**, CNY 300,000, Nov 2022.
- **NSFC & Science and Technology Development Fund from Macau (FDCT-0076/2022/AFJ).** "Fundamental research on design and long-term regulation of metamaterials used for water inrush plugging in tunnel". **Principal Investigator**, MOP 2,000,000, Dec 2022.
- **Science and Technology Development Fund from Macau (FDCT-0040/2022/A1).** "Design of ultrafine nanoparticle modified salt-alkali-resistant water-absorbent polymer applied in concrete internal curing system". **Principal Investigator**, MOP 2,769,000, Dec 2022.
- **Guangzhou Huangpu District Science and Technology Bureau (2021GH09).** "Development and industrialization of water-resistant and weather-resistant UNP composite photocurable pressure-sensitive adhesive Material". **Co-Principal Investigator**, CNY 300,000, Dec 2021.
- **Multi-Year Research Grant from University of Macau (MYRG2022-00217-IAPME).** "Ice-templated Cementitious Electrolyte with Wood-like Structure Used in Structural Energy Storage". **Principal Investigator**, MOP 288,000, January 2023.
- **Guangdong Provincial Department of Science and Technology (2022A0505030026).** "Phase-change microcapsule composite lightweight high-strength nano-foam concrete applied to building structure self-insulation materials and engineering research"**. Principal Investigator**, CNY 260,000, Sept 2022.
- **NSFC Excellent Young Scientists Fund (HK&Macau)（52122001）**"High-Performance Concrete Designed by Nanotechnology". **Principal Investigator**, CNY 1,600,000, August 2021.
- **Shenzhen-Hong Kong-Macao science and technology plan（C）(SGDX2020110309360301).** "Improvement of the performance of functional polymer with Ultra-tiny nanoparticles". **Principal Investigator**, CNY 1,000,000, July 2021.
- **Science and Technology Development Fund from Macau (FDCT-0138/2020/A3).** "Superabsorbent hydrogel modified scour-resistant hydraulic concrete". **Principal Investigator**, MOP 2,458,000, June 2021.
- **Zhuhai Communications Engineering Technology Co. LTD (CP-008-2020).** "Research on Dynamic On-board Monitoring System Based on New Cement-based Piezoelectric Sensor Technology". **Principal Investigator**, CNY 600,000, July 2020.
- **Multi-Year Research Grant from University of Macau (MYRG2019-00118-IAPME).** "Poly (ionic liquid) (PILs) as a Clay-Specific Sacrificial Agent for Polycarboxylate Ether (PCE) Superplasticizers". **Principal Investigator**, MOP 750,000, January 2020.
- **Multi-Year Research Grant from University of Macau (MYRG2018-00139-IAPME).** "Super elastic oleogel enhanced by cement-released nanoparticles for laminated buffer structure". **Principal Investigator**, MOP 945,000, January 2019.
- **Science and Technology Development Fund from Macau (FDCT-0074/2018/A2).** "Constructed matrix releases ultra-tiny nanoparticles at a very low dosage to strengthen high-performance polymer nanocomposites". **Principal Investigator**, MOP 2,467,500, November 2018.

- **China Ministry of Science and Technology & Science and Technology Development Fund from Macau (FDCT-010/2017/AMJ).** "Cement-based piezoelectric composites, element and health monitoring technique for internet of things of concrete structure". **Principal Investigator**, MOP 1,015,000, September 2018.
- **Science and Technology Development Fund from Macau (FDCT-017/2017/AIR).** "Development and Application of Innovative Light-weight Nano-foam Concrete". **Co-Investigator**, MOP 1,440,000, May 2018.
- **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 (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.

- Chemical Engineering Journal (Elsevier)
- 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)
- Powder Technology (Elsevier)
- Journal of the American Ceramic Society (Wiley)

Award

- 2019 2nd Prize of Building Materials Science and Technology Award, February 2019.
- 2019 International Association of Advanced Materials (IAAM) Scientist Medal, at the 27th award ceremony of the International Association of Advanced Materials (IAAM), Stockholm, Sweden, August 12, 2019.
- Best Oral Presentation Award, 2019 Advances in Civil and Ecological Engineering Research

(ACEER), Kaohsiung, Taiwan, China, July 03, 2019.

- Best Oral Presentation Award, 2019 4th International Conference on Environmental Engineering and Sustainable Development (CEESD 2019), Xiamen, Fujian, China, December 07, 2019.

PUBLICATIONS

Journal Papers (*Corresponding Author):

1. Yingzi Gu, Yunjian Li, Guangxu Ju, Tingyun Zheng, Rui Liang* and **Guoxing Sun***. PCM microcapsules applicable foam to improve the properties of thermal insulation and energy storage for cement-based material. *Construction and Building Materials*. 2023, 409, 134144.
2. Qingyuan Li, Huibo Wang, Yueyang Wang, **Guoxing Sun**, Zongjin Li, Yanyan Zhang, Huaiyu Shao, Yinzhu Jiang*. Yuxin Tang* and Rui Liang*. Critical Review of Emerging Pre-metallization Technologies for Rechargeable Metal-Ion Batteries. *Small*. 2023, 2306262.
3. Huagao Wang, Rongjian Lu, Lei Li, Cheng Liang, Jia Yan, Rui Liang, **Guoxing Sun**, Lei Jiang and Qunfeng Cheng*. Strong, tough and thermally conductive nacre-inspired boron nitride nanosheet/epoxy layered nanocomposites. *Nano Research*. 2023.
4. Qing Liu, Xing Ming, Jianyu Xu, Dongshuai Hou, **Guoxing Sun**, Zongjin Li* and Guoqing Geng*. Robust cement composite with low hydration temperature and high mechanical performance achieved by Field's metal and acrylic acid-acrylamide copolymer. *Construction and Building Materials*. 2023, 387, 131655.
5. Annan Zhu, Hao Gu, Wang Li, Jinfeng Liao, Junmin Xia, Chao Liang, **Guoxing Sun**, Zhendong Sha* and Guichuan Xing*. Synergistic Passivation With Phenylpropylammonium Bromide for Efficient Inverted Perovskite Solar Cells. *Small Methods*. 2023, 2300428.
6. Jingjing Xiang, Youchen Hao, Yuting Gao, Lei Ji, Li Wang, **Guoxing Sun**, Yuxin Tang, Yaofeng Zhu* and Yinzhu Jiang*. Tailoring the growth of iron hexacyanoferrates for high-performance cathode of sodium-ion batteries. *Journal of Alloys and Compounds. 2023,* 946, 169284.
7. Qing Liu, Zeyu Lu, Jianyu Xu, Zongjin Li* and **Guoxing Sun***. Insight into the in situ copolymerization of monomers on cement hydration and the mechanical performance of cement paste. *Journal of Sustainable Cement-Based Materials*. 2023, 12 (6), 736-750.
8. Qing Liu, Xing Ming, Miaomiao Wang, Zongjin Li, **Guoxing Sun** and Rui Liang*. Improved Mechanical Strength of Cement Paste by Polyvinylpyrrolidone and In Situ Polymerized Acrylic Acid. *Journal of Materials in Civil Engineering*. 2023, 35(5),04023096.
9. Yao Huang, Xuan Zhang, Lei Ji, Li Wang, Ben Bin Xu, Muhammad Wakil Shahzad, Yuxin Tang*, Yaofeng Zhu, Mi Yan, **Guoxing Sun** and Yinzhu Jiang*. Boosting the sodium storage performance of Prussian blue analogs by single-crystal and high-entropy approach. *Energy Storage Materials*. 2023, 58, 1-8.
10. Yuting Gao, Yao Huang, Hongge Pan, Lei Ji, Li Wang, Yuxin Tang, Yaofeng Zhu, Mi Yan, **Guoxing Sun**, Wenbin Ni* and Yinzhu Jiang*. Towards Defect-Free Prussian Blue-Based Battery Electrodes. *Journal of Alloys and Compounds*. 2023, 950,169886.
11. Huagao Wang, Rongjian Lu, Jia Yan, Jingsong Peng, Antoni P Tomsia, Rui Liang, **Guoxing Sun**, Mingjie Liu, Lei Jiang and Qunfeng Cheng*. Tough and Conductive Nacre - inspired

MXene/Epoxy Layered Bulk Nanocomposites. *Angewandte Chemie International Edition.* 2023, 62, (9), e202216874.

12. Tingzhong Li, Qinglu Yu, Zhuang Du, Jie Gao, LU Dong, Rui Liang* and **Guoxing Sun***. A preparation strategy for multicolor carbon dots embedded in silicone for latent fingermarks and detection of AcO−. *New Journal of Chemistry.* 2023, 25.
13. Muthukkumaran Karthikeyan*, Yi-Rui Tang, Niraj Kumar, Dongyu Xu, Zongjin Li and **Guoxing Sun***. Low-temperature electrical transport and tunable optical properties of Mo-doped V2O3 thin films. *Materials Science and Engineering: B.* 2023, 287, 116130.
14. Yuwei Li, Yu Liu, Senio Campos de Souza, Tzuwei Chao, Lei Dong, **Guoxing Sun**, Chunming Wang* and Yiming Niu*. Differential Foreign Body Reactions between Branched and Linear Glucomannan Scaffolds. *Journal of Functional Biomaterials.* 2022, 13, 4, 292.
15. Yulin Mao, Chao Liang, Gang Wang, Yueyang Wang, Zhipeng Zhang, Bingzhe Wang, Zhaorui Wen, Zhen Mu, **Guoxing Sun**, Shi Chen* and Guichuan Xing*. Enhanced Amplified Spontaneous Emission from All‐Inorganic Perovskite Thin Films by Composition Engineering. *Advanced Optical Materials.* 2022, 10, 24, 2201845.
16. Ziyi Dai, Hongda Guo, Qiaoxian Huang, Sen Ding, Yiteng Liu, Yibo Gao, Yinning Zhou, **Guoxing Sun*** and Bingpu Zhou*. Mechanically robust and superhydrophobic concrete based on sacrificial template approach. *Cement and Concrete Composites.* 2022, 134, 104796.
17. Miaomiao Wang, Qing Liu, Xiaoxu Liang, Jianyu Xu, Zongjin Li, Rui Liang* and **Guoxing Sun***. Influence of Metakaolin on Properties of Magnesium Potassium Phosphate Cement with High Water-to-Solid Ratio. *Journal of Materials in Civil Engineering.* 2022, 34, 9.
18. Qing Liu, Zeyu Lu, Jianyu Xu, Zongjin Li* and **Guoxing Sun***. Insight into the in situ copolymerization of monomers on cement hydration and the mechanical performance of cement paste. *Journal of Sustainable Cement-Based Materials.* 2022, 1-13.
19. Muthukkumaran Karthikeyan*, Yi-Rui Tang, Niraj Kumar, Dongyu Xu, Zongjin Li and **Guoxing Sun*.** Low-temperature electrical transport and tunable optical properties of Mo-doped V2O3 thin films. *Materials Science and Engineering: B.* 2023, 287, 116130
20. Huagao Wang, Rongjian Lu, Jia Yan, Jingsong Peng, Antoni P Tomsia, Rui Liang, **Guoxing Sun**, Mingjie Liu, Lei Jiang and Qunfeng Cheng*. Tough and Conductive Nacre-inspired MXene/Epoxy Layered Bulk Nanocomposites. *Angewandte Chemie International Edition*. 2022.
21. Guangbao Wu, Rui Liang, Mingzheng Ge, **Guoxing Sun***, Yuan Zhang* and Guichuan Xing. Surface Passivation Using Two Dimensional Perovskites Towards Efficient and Stable Perovskite Solar Cells. *Advanced Materials.* 2021, 34, 2105635.
22. Lirong Liang, Miaomiao Wang, Xiaodong Wang, Peng Peng, Zhuoxin Liu*, Guangming Chen* and **Guoxing Sun***. Initiating a Stretchable, Compressible, and Wearable Thermoelectric Generator by a Spiral Architecture with Ternary Nanocomposites for Efficient Heat Harvesting. *Advanced Functional Materials.* 2021, 2111435.
23. **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.

24. Guangbao Wu, Rui Liang, Zhipeng Zhang, Mingzheng Ge, Guichuan Xing* and **Guoxing Sun***. 2D Hybrid Halide Perovskites: Structure, Properties, and Applications in Solar Cells. *Small*. 2021, 17, 2103514.
25. Bibo Yin, Rui Liang, Xiaoxu Liang, Duo Fu, Lei Wang* and **Guoxing Sun***. Construction of Stable Wide-Temperature-Range Proton Exchange Membranes by Incorporating a Carbonized Metal–Organic Frame into Polybenzimidazoles and Polyacrylamide Hydrogels. *Small*. 2021, 17, 2103214.
26. Lirong Liang, Haicai Lv, Xiao-Lei Shi, Zhuoxin Liu*, Guangming Chen*, Zhi-Gang Chen* and **Guoxing Sun***. A flexible quasi-solid-state thermoelectrochemical cell with high stretchability as an energy-autonomous strain sensor. *Materials Horizons*. 2021, 8, 2750-2760.
27. Qiao Wang, Hongyao Ding, Xiaoxu Liang, Xiaosai Hu, Miaomiao Wang, Qing Liu, Zongjin Li, and **Guoxing Sun***. A dual-trigger-mode ionic hydrogel sensor for contact or contactless motion recognition. *Materials Horizons*.2020, 7, 2673-2682.
28. Bibo Yin, Peng Wang, Yingnan Wu, Chunfa Liu, Lei Wang*, **Guoxing Sun***. An effective strategy for the preparation of a wide-temperature-range proton exchange membrane based on polybenzimidazoles and polyacrylamide hydrogels. *Journal of Materials Chemistry A*. 2021, 9, 3605-3615.
29. Xiaosai Hu, Qiao Wang, Qing Liu, Zongjin Li, **Guoxing Sun*.** Villus-like nanocomposite hydrogels with a super-high water absorption capacity. *Journal of Materials Chemistry A*. 2020, 8, 12613.
30. Xiaosai Hu, Rui Liang, and **Guoxing Sun***. Super-adsorbent hydrogel for removal of methylene blue dye from aqueous solution. *Journal of Materials Chemistry A*. 2018, 6, 17612-17624.
31. Rui Liang, Qing Liu, Dongshuai Hou*, Zongjin Li and **Guoxing Sun***.Flexural strength enhancement of cement paste through monomer incorporation and in situ bond formation. *Cement and Concrete Research*. 2022, 152, 106675.
32. Jianyu Xu, Qing Liu, Hongda Guo, Miaomiao Wang, Zongjin Li* and **Guoxing Sun***. Low melting point alloy modified cement paste with enhanced flexural strength, lower hydration temperature, and improved electrical properties. *Composites Part B: Engineering*, 2022, 232, 109628.
33. Ziqing Tang, Hongda, Guo, Jianyu Xu, Zongjin Li* and **Guoxing Sun***. Cationic poly(diallyldimethylammonium chloride) based hydrogel for effective anionic dyes adsorption from aqueous solution. *Reactive and Functional Polymers*, 2022, 174, 105239.
34. Peixian Huo, Hongyao Ding, Ziqing Tang, Xiaoxu Liang, Jianyu Xu, Miaomiao Wang, Rui Liang* and **Guoxing Sun*.** Conductive silk fibroin hydrogel with semi-interpenetrating network with high toughness and fast self-recovery for strain sensors. *International Journal of Biological Macromolecules*, 2022, 212,1-10.
35. Hongda Guo, Jianyu Xu, Ziqing Tang, Qing Liu, Miaomiao Wang, Rui Liang* and **Guoxing Sun***. Effect of super water absorbing polymer based anti-washout admixtures on the properties of seawater-mixed cement paste. *Materials and Structures*, 2022, 59.

36. Lirong Liang, Xiaodong Wang, Zhuoxin Liu*, **Guoxing Sun*** and Guangming Chen*. Recent advances in organic, inorganic, and hybrid thermoelectric aerogels. *Chinese Physics B*, 2022, 31, 027903.
37. Jianyu Xu, Hongda Guo, Hongyao Ding, Qiao Wang, Ziqing Tang, Zongjin Li, and **Guoxing Sun***. Printable and Recyclable Conductive Ink Based on a Liquid Metal with Excellent Surface Wettability for Flexible Electronics. *ACS Applied Materials & Interfaces.* 2021, 13, 7443-7452.
38. Qi Chen, Sihong Chen, Hanqing Wu, Xiaoqing Zeng, Weiqing Chen, **Guoxing Sun** and Zhaoyang Wang. Application of 2-Aminopyridines in the Synthesis of Five-and Six-Membered Azaheterocycles. *Chinese Journal of Organic Chemistry*. 2021, 41, 10.
39. Qing Liu, Zeyu Lu, Xiaosai Hu, Binmeng Chen, Zongjin Li, Rui Liang* and **Guoxing Sun***. A mechanical strong polymer-cement composite fabricated by in situ polymerization within the cement matrix. *Journal of Building Engineering*, 2021, 42, 103048.
40. Hongyao Ding，Xiaoxu Liang，Jianyu Xu，Ziqing Tang, Zongjin Li, Rui Liang*, and **Guoxing Sun***. Hydrolyzed Hydrogels with Super Stretchability, High Strength, and Fast Self-Recovery for Flexible Sensors. *ACS Applied Materials & Interfaces.* 2021, 13, 22774-22784.
41. Lin Chi*, Xiaohong Zhang and **Guoxing Sun.** Embedded resistivity sensor for compressive strength prediction of cement paste by electrochemical impedance spectroscopy. *IEEE Sensors Letters*, 2021, 5.
42. Lefan Li, Qiao Wang, Xiaoxu Liang, Zongjin Li, Siyao Guo* and **Guoxing Sun***. Regulation of the Elasticity and Temperature Tolerance of Polyacrylamide/Ca(OH)2 Nanocomposite Organogel using a Two-component Organic Solvent, *Polymer Testing*, 2021, 99, 107018.
43. Dan He, Zeyu Lu, Xiaoxu Liang, Renjun Liu and **Guoxing Sun***, A Study to Improve the Compatibility of PCE with Cement Paste Containing Clay. *Materials Letters*, 2021,131111.
44. Renjun Liu, Qing Liu, Dan He, **Guoxing Sun**, Zongjin Li, and Yu Zhu*. Enhancement of the Piezoelectric Property of Polyvinylidene Fluoride through Electroactive Phase Enrichment and the Application in Piezoelectric Generators. *ACS Applied Electronic Materials.* 2021, 3, 1804-1812.
45. Miaomiao Wang, Lirong Liang, Qing Liu, Xiaoxu Liang, Hongda Guo, Zongjin Li, Rui Liang*, and **Guoxing Sun***. Influence of dipotassium hydrogen phosphate on properties of magnesium potassium phosphate cement. *Construction and Building Materials.* 2022, 320, 126283.
46. Hongda Guo, Ziqing Tang, Qing Liu, Jianyu Xu, Miaomiao Wang, Rui Liang* and **Guoxing Sun***. Ultra-stable anti-washout cement grout achieved by super water absorbing villus-like nanocomposite hydrogel. *Construction and Building Materials.* 2021, 301, 124035.
47. Dongshuai Hou, Wei Zhang, Zheng Chen*, Qi Zheng, **Guoxing Sun** and Rui Liang. A molecular dynamics study of silicene reinforced cement composite at different humidity: Surface structure, bonding, and mechanical properties. *Construction and Building Materials.* 2021, 291, 123242.
48. Qing Liu, Zeyu Lu, Xiaoxu Liang, Rui Liang, Zongjin Li and **Guoxing Sun***. High flexural strength and durability of concrete reinforced by in situ polymerization of acrylic acid and 1-

acrylanmido-2-methylpropanesulfonic acid. *Construction and Building Materials.* 2021, 292, 123428.

49. Yue Zhang, Qingqing Xu, Ming Sun, Chuansheng Xiong, Pan Wang, Zheng Chen, **Guoxing Sun,** Jing Guan, Zhiheng Ding, Mengmeng Li, and Dongshuai Hou*. Insights into vitamin B3, B6 and C as inhibitor of steel reinforcement: A DFT + U study. *Construction and Building Materials*. 2021, 294, 123571.
50. Ziqing Tang, Xiaosai Hu, Hongyao Ding; Zongjin Li, Rui Liang* and **Guoxing Sun***. Villi-like poly(acrylic acid) based hydrogel adsorbent with fast and highly efficient methylene blue removing ability. *Journal of Colloid and Interface Science*. 2021, 594, 54-63.
51. Lirong Liang, Xiaodong Wang, Miaomiao Wang, Zhuoxin Liu*, Guangming Chen*, **Guoxing Sun*.** Flexible poly (3,4-ethylenedioxythiophene)-tosylate/SWCNT composite films with ultrahigh electrical conductivities for thermoelectric energy harvesting, *Composites Communications*, 2021, 25, 100701.
52. Qing Liu, Renjun Liu, Qiao Wang, Rui Liang, Zongjin Li, and **Guoxing Sun***. Cement mortar with enhanced flexural strength and durability-related properties by in situ polymerized interpenetration network. *Frontiers of Structural and Civil Engineering,* 2021, 15, 99–108.
53. Hongda Guo, Qing Liu, Jianyu Xu and **Guoxing Sun***. Design of High Strength and Lightweight Construction Composites Using Advanced Porous and Tough Cementitious Materials. *Journal of Advanced Concrete Technology.* 2021, 19, 240-247.
54. Hongyao Ding, Xiaoxu Liang, Qiao Wang, Miaomiao Wang, Zongjin Li, and **Guoxing Sun***. A semi-interpenetrating network ionic composite hydrogel with low modulus,fast self-recoverability and high conductivity as flexible sensor. *Carbohydrate Polymers.* 2020, 248, 116797.
55. Asad Hanif, Zeyu Lu, Pavithra Parthasarathy, Dongshuai Hou, Zongjin Li, and **Guoxing Sun***. Strength and hydration attributes of cement pastes containing nano titania and cenosphere. *Advances in Cement Research*. 2020, 12, 557-572.
56. Jianyu Xu, Guanghui Gao, Lijie Duan*, and **Guoxing Sun***. Protein and Hydrophobic Association-Regulated Hydrogels with Adhesive Adjustability in Different Materials. *Advanced Materials Interfaces.* 2020, 7, 1901541.
57. Siyao Guo, Huihua Luo, Ying Li*, Jizhou Chen, Ben Mou, Xueqing Shi, and **Guoxing Sun***. Structure-controlled three-dimensional BiOI/MoS2 microspheres for boosting visible-light photocatalytic degradation of tetracycline. *Journal of Alloys and Compounds.* 2020, 852, 157026.
58. Qing Liu, Wenjie Liu, Zongjin Li, Siyao Guo*, and **Guoxing Sun***. Ultra-lightweight cement composites with excellent flexural strength, thermal insulation and water resistance achieved by establishing interpenetrating network. *Construction and Building Materials*. 2020, 250, 118923.
59. Dan He, Rui Liang, Juan Zhao, Zhengping Liu, Zeyu Lu, and **Guoxing Sun***. Effect of ionic liquids in compatibility with PCE and cement paste containing clay. *Construction and Building Materials.* 2020, 264, 120265.
60. Pan Wang, Gang Qiao, Dongshuai Hou*, Zuquan Jin, Muhan Wang, Jinrui Zhang, and **Guoxing Sun**. Functionalization enhancement interfacial bonding strength between graphene

sheets and calcium silicate hydrate: Insights from molecular dynamics simulation. *Construction and Building Materials.* 2020, 261, 120500.

61. Lirong Liang, Jueshuo Fan, Miaomiao Wang, Guangming Chen*, and **Guoxing Sun***. Ternary thermoelectric composites of polypyrrole/PEDOT:PSS/carbon nanotube with unique layered structure prepared by one-dimensional polymer nanostructure as template. *Composites Science and Technology*. 2020, 187, 107948.
62. Miaomiao Wang, Qiao Wang, Lirong Liang, Hongyao Ding, Xiaoxu Liang, and **Guoxing Sun***. High-content graphene-reinforced polymer with bioinspired multilayer structure. *Journal of Materials Science.* 2020, 55, 16836-16845.
63. Wenbin Hao*, Peng Luo, Zhiqiang Wu, **Guoxing Sun** and Yongli Mi. Feasibility of pine bark pellets and their pyrolyzed biochar pellets as fuel sources in molten hydroxide direct carbon fuel cells. *Energy and Fuels,* 2020, 34.
64. Qingyun Lv, Xiaosai Hu, Yong Shen, and **Guoxing Sun***. Polymer hydrogel cross-linked by inorganic nanoparticles for removing trace metal ions. *Journal of Applied Polymer Science*. 2020, 137.
65. Xuejing Sun, Jianyang Zhu*, Asad Hanif, Zongjin Li, and **Guoxing Sun***. Effects of blade shape and its corresponding moment of inertia on self-starting and power extraction performance of the novel bowl-shaped floating straight-bladed vertical axis wind turbine. *Sustainable Energy Technologies and Assessments*. 2020, 8, 100648.
66. Hongyao Ding, Xiaoxu Liang, Si Yu Zheng, Qiao Wang, Zongjin Li, **Guoxing Sun***. Actuators assembled from hydrogel blocks of various shapes via condensation reactions. *Materials Chemistry and Physics*. 2020, 253, 123332.
67. Jiao Yu, Song Gao, Dongshuai Hou*, Pan Wang, and **Guoxing Sun**. Water Transport Mechanisms of Poly (acrylic acid), Poly (vinyl alcohol), and Poly (ethylene glycol) in C-S-H Nanochannels: A Molecular Dynamics Study. *The Journal of Physical Chemistry B.* 2020, 124, 6095-6104.
68. Xiaoxu Liang, Hongyao Ding, Qiao Wang, Miaomiao Wang, Bibo Yin, and **Guoxing Sun***. Nature-inspired semi-IPN hydrogels with tunable mechanical property and multi-responsiveness, *New Journal of Chemistry*, 2020, 45, 861-871.
69. Xuejing Sun, Jianyang Zhu*, Zongjin Li, and **Guoxing Sun**. Rotation improvement of vertical axis wind turbine by offsetting pitching angles and changing blade numbers. *Energy.* 2020, 119177.
70. Zeyu Lu, Binmeng Chen, ChristopherK.Y. Leung, Zongjin Li, and **Guoxing Sun***. Aggregation size effect of graphene oxide on its reinforcing efficiency to cement-based materials. *Cement and Concrete Composite.* 2019, 100, 85-91.
71. Qingyun Lv, Xiaosai Hu, Xiaoling Zhang, Liyan Huang, Zhengping Liu, and **Guoxing Sun***. Highly efficient removal of trace metal ions by using poly(acrylic acid) hydrogel adsorbent. *Materials and Design*. 2019, 181, 107934.
72. Xiaosai Hu, Rui Liang, Jun Li, Zhengping Liu*, and **Guoxing Sun***. Mechanically strong hydrogels achieved by designing homogeneous network structure. *Materials & Design*. 2019, 163, 107547.

73. Hongyao Ding, Xiaoxu Liang, Xinning Zhang, Ziliang Wu, Zongjin Li, and **Guoxing Sun***. Tough supramolecular hydrogels with excellent self-recovery behavior mediated by metal-coordination interaction. *Polymer.* 2019, 171, 201–210.
74. Qiao Wang, Lefan Li, Zeyu Lu, Xiaosai Hu, Zongjin Li, and **Guoxing Sun***. Highly Dispersed Graphene Network Achieved by using a Nanoparticle-Crosslinked Polymer to Create a Sensitive Conductive Sensor. *ChemElectroChem*. 2019, 6, 5006–5013.
75. Xiaoxu Liang, Hongyao Ding, Qiao Wang, and **Guoxing Sun***. Tough physical hydrogels reinforced by hydrophobic association with remarkable mechanical property, rapid stimuli-responsiveness and fast self-recovery capability. *European Polymer Journal.* 2019, 120, 109278.
76. Dongshuai Hou, Jianyu Xu, Yu Zhang*, and **Guoxing Sun***. Insights into the molecular structure and reinforcement mechanism of the hydrogel-cement nanocomposite: An experimental and molecular dynamics study. *Composites Part B.* 2019, 177, 107421.
77. Wenbin Hao*, Hongyan Ma**, **Guoxing Sun**, and Zongjin Li. Magnesia phosphate cement composite bipolar plates for passive type direct methanol fuel cells. *Energy.* 2019, 168, 80-87.
78. Asad Hanif, Su Diao, Huafu Pei, Zongjin Li, and **Guoxing Sun***.Green Lightweight Laminated Cementitious Composite (LCC) for Wind Energy Harvesting – A novel application of LCCs. *Case Studies in Construction Materials.* 2019, 10, e00217.
79. Qiao Wang, Lefan Li, Zongjin Li, Siyao Guo, and **Guoxing Sun***. Environmentally Stable Polymer Gels with Super Deformability and High Recoverability Enhanced by Sub-5 nm Particles in the Nonvolatile Solvent. *Journal of Polymer Science, Part B: Polymer Physics.* 2019, 57, 713-721.
80. Lefan Li, Qiao Wang, Zongjin Li, Siyao Guo*, and **Guoxing Sun***. Non-Volatile Glycerin Gel Enhanced by Sub-5 nm Particles with Super Elasticity, Recoverability, and High Temperature Resistance. *Macromolecular Chemistry and Physics.* 2019, 1800464.
81. Qing Liu, Rui Liang, Zongjin Li, Siyao Guo* and **Guoxing Sun***. Mechanical strong and durable cement mortars reinforced by controlling the polymer phase size. *Materials Research Express*. 2019, 6, 075203.
82. **Guoxing Sun**. Calcium and Building Materials: A Special Article on Calcium Element. Chinese Journal of Chemical Education. 2019.
83. Zeyu Lu, Asad Hanif, Cong Lu*, **Guoxing Sun**, Yu Cheng, and 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.
84. Xiaosai Hu, Rui Liang,Jun Li,Zhengping Liu*, and **Guoxing Sun***. Highly Stretchable Self-Healing Nanocomposite Hydrogel Reinforced by 5 nm Particles. *ES Materials & Manufacturing.* 2018, 2, 16-23.
85. Siyao Guo, Jun Shang, Tiejun Zhao, Dongshuai Hou*, Zuquan Jin, and **Guoxing Sun***.TiO_2/Cyclodextrin Hybrid Structure with Efficient Photocatalytic Water Splitting. *ES Materials & Manufacturing.* 2018, 2, 24-27.

86. Chao Sun, Yu Zhu, Jian Guo, Yamei Zhang*, and **Guoxing Sun***. Effects of foaming agent type on the workability, drying shrinkage, frost resistance and pore distribution of foamed concrete. *Construction and Building Materials*. 2018, 186, 833-839.
87. Zeyu Lu, Asad Hanif*, Cong Lu, Kaiju Liu, **Guoxing Sun**, and Zongjin Li. A novel lightweight cementitious composite with enhanced thermal insulation and mechanical properties by extrusion technique. *Construction and Building Materials*. 2018, 163, 446-449.
88. Rui Liang, Zongjin Li, Lu-Tao Weng, Lina Zhang, and **Guoxing Sun***. Recoverable hydrogel with high stretchability and toughness achieved by low-temperature hydration of Portland cement. *Materials Chemistry Frontiers.* 2018, 2, 2076-2080.
89. Zeyu Lu, Asad Hanif*, **Guoxing Sun**, Rui Liang, Pavithra Parthasarathy, and Zongjin Li. Highly dispersed graphene oxide electrodeposited carbon fiber reinforced cement-based materials with enhanced mechanical properties. *Cement and Concrete Composite.* 2018, 87, 220-228.
90. Zhiyang Jin, Yuanyuan Tian, Xiaoxiao Xu, Hongzhi Cui*, Waiching Tang, Yanchun Yun, and **Guoxing Sun**. Experimental Investigation on Graphene Oxide/$SrCl_2 \cdot 6H_2O$ Modified $CaCl_2 \cdot 6H_2O$ and the Resulting Thermal Performances. *Materials*. 2018, 11, 1507.
91. Zeyu Lu, Dongshuai Hou, Asad Hanif, Wenbin Hao*, Zongjin Li, and **Guoxing Sun***. Comparative evaluation on the dispersion and stability of graphene oxide in water and cement pore solution by incorporating silica fume. *Cement and Concrete Composites*. 2018, 94, 33-42.
92. **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 Composites*. 2017, 78, 57-62.
93. **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.
94. Siyao Guo, Jianguo Dai*, Tiejun Zhao, Shuaidong Hou, Peng Zhang, Penggang Wang, and **Guoxing Sun***. A novel microporous amorphous-ZnO@TiO_2/graphene ternary nanocomposite with enhanced photocatalytic activity. *RSC Advances*. 2017, 7, 36787-36792.
95. Yamei Zhang*, Chao Sun, Shen Wang, Yu Zhu, and **Guoxing Sun**. Properties and pore structure of foam concrete with different density. *Journal of Chongqing University*. doi:10.11835/j.issn.1000-582X.2020.102.
96. Lu Han, Xiong Lu, Kezhi Liu, Kefeng Wang, Liming Fang, Lutao Weng, Hongping Zhang, Youhong Tang, Fuzeng Ren, Cancan Zhao, **Guoxing Sun**, Rui Liang, and Zongjin Li. Mussel-Inspired Adhesive and Tough Hydrogel Based on Nanoclay Confined Dopamine Polymerization. *ACS Nano.* 2017, 11, 2561-2574.
97. **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.
98. 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.

99. 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.
100. 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.
101. Xiaoliang Wang, Jawayria Mujtaba, Fang Fang, Mashkoor Ahmad, Hamidreza Arandiyan, Hongping Yang, **Guoxing Sun** and Hongyu Sun*. Constructing aligned γ -Fe2O3 nanorods with internal void space anchored on reduced graphene oxide nanosheets for excellent lithium storage. Rsc Advances, 2015, 5, 91574-91580.
102. 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.
103. 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.
104. 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.
105. 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.
106. 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.
107. **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.
108. 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.
109. **Guoxing Sun**, LuTao 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.
110. **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.
111. 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.
112. **Guoxing Sun**, Guangming Chen*, and Zhengping Liu*. Dispersion of pristine multi-walled carbon nanotubes in common organic solvents. *Nano.* 2010, 5, 103-109.

113. **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.
114. **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.
115. **Guoxing Sun**, Guangming Chen*, and Zhengping Liu*. Progress in polystyrene/carbon nanotube composites. *Chinese Polymer Bulletin*. 2009, 2, 12-20.

Patents:

1. **Guoxing Sun**.一种现浇纳米泡沫混凝土及其制备方法和应用. Chinese Full Patent Application No. 202210461243.X
2. **Guoxing Sun**, Rui Liang, Xiaojiang Wu. 一种可用于门板的纳米泡沫玻璃微珠混凝土及其制备方法. Chinese Full Patent Application No. 202210029165.6
3. **Guoxing Sun**. 一种轻质混凝土. Chinese Full Patent Application No. 202110454019.3.
4. **Guoxing Sun**. 一种泡沫混凝土及其制备方法和应用. Chinese Full Patent Application No. 202110460117.8
5. **Guoxing Sun**, Tomi Nissinen, and Ivan M.L. Sham. Foam formulation and method of preparing solid porous materials with same. 05/05/2016. US Issued Patent No. 15/146921.
6. **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 Issued Patent No. 201710183416.5.
7. Zongjin Li, and **Guoxing Sun**. 纳米复合水凝胶材料及制备方法. Chinese Issued Patent No. 201910268432.3.
8. **Guoxing Sun**, Xiaosai Hu, and Zongjin Li. 一种超吸水水凝胶材料及其制备方法和应用. Chinese Full Patent Application No. 201910268432.3.
9. **Guoxing Sun**, Xiaosai Hu, and Zongjin Li. 高分子导电水凝胶材料及制备方法. Chinese Full Patent Application No. 201910239903.8.
10. Zongjin Li, Binmeng Chen, **Guoxing Sun**, and Rui Liang. 一种聚合物水泥基材料及其制备方法与应用. Chinese Full Patent Application No. 202010274758.X.
11. **Guoxing Sun**, Dan He, and Zongjin Li. 一种填充了离子液体作为聚羧酸酯类减水剂专用牺牲剂的水泥基浆料及其制备方法. Chinese Issued Patent No. 202010416779.0.
12. 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.
13. 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).

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