

CURRICULUM VITAE



Personal information

Name: Xiaoqin Sun

Gender: Female

Major: Civil Engineering-Heating, Ventilation and Air Conditioning (HVAC)

Affiliation: Changsha University of Science and Technology

Specialization: Thermal Analysis of Buildings

Physical Energy Storage

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Education and work

	Postdoctoral Research fellow	
2017/9-2019/9	in Civil, Environmental & Architectural Engineering	University of Kansas
2016/11-now	Associate Professor in Civil Engineering	Changsha University of Science & Technology
2014/10-2016/11	Assistant Professor in Civil Engineering	Changsha University of Science & Technology
2011/09-2014/10	Ph.D. in HVAC	Hunan University
2012/08-2013/08	Visiting Student	University of Kansas
2009/09-2011/07	M.S. in HVAC	Hunan University
2005/09-2009/07	B.S. in HVAC	Yanshan University

Honors and Awards

2017 Distinguished Young Scholar in Changsha

2017 Young Talent in Hunan Province

2016 Young Science and Technology Talent in Changsha

2016 Innovation Achievement Award by National Federation of Returned Overseas Chinese

- 2015 Science and Technology Progressive Award in Hunan Province
- 2015 Science and Technology Progressive Award in Changsha City
- 2012 Excellent Paper Award in the International Conference on Low Carbon Town and Physical Energy Storage

Publications

1. **Xiaoqin Sun**, Yajing Mo, Jie Li, Youhong Chu, Lihui Liu, Shuguang Liao. Study on the energy charging process of a plate-type latent heat thermal energy storage unit and optimization using Taguchi method. *Applied Thermal Engineering* 164(2020) 114528.
2. **Xiaoqin Sun**, Jovana Jovanovic, Yuan Zhang, Siyuan Fan, Youhong Chu, Yajing Mo, Shuguang Liao. Use of encapsulated phase change materials in lightweight building walls for annual thermal regulation. *Energy* 180(2019) 858-872.
3. **Xiaoqin Sun**, Jovana Jovanovic, Siyuan Fan, Youhong Chu, Yajing Mo, Shuguang Liao. A Reduced-scale Experiment to Evaluate the Thermal Performance of Building Envelopes Containing Phase Change Material Spheres. *Building Simulation* (2019) 1-12. <https://doi.org/10.1007/s12273-019-0529-1>
4. **Xiaoqin Sun**, Yuan Zhang, Mario A. Medina. Potential thermal enhancement of lightweight building walls derived from using phase change materials (PCMs). *Frontiers in Energy Research* 7(2019) 1-10.
5. **Xiaoqin Sun**, Youhong Chu, Mario A. Medina, Yajing Mo, Siyuan Fan, Shuguang Liao. Experimental investigations on the thermal behavior of phase change material (PCM) in ventilated slabs. *Applied Thermal Engineering* 148(2019) 1359-1369.
6. **Xiaoqin Sun**, Mario A. Medina, Kyoung Ok Lee, Xing Jin. Laboratory assessment of residential building walls containing pipe-encapsulated phase change materials for thermal management. *Energy* 163(2018) 383-391.
7. **Xiaoqin Sun**, Kyoung Ok Lee, Mario A. Medina, Youhong Chu, Chuanchang Li. Melting temperature and enthalpy variations of phase change materials (PCMs): a differential scanning calorimetry (DSC) analysis. *Phase transitions* 91(6) 2018 667-680. (SCI, IF: 1.06)
8. **Xiaoqin Sun**, Li Ling, Shuguang Liao, Youhong Chu, Siyuan Fan, Yajing Mo. *Energy Conversion and Management* 155(2018) 230-242. (SCI, IF: 5.589)
9. Jovana Jovanovic, **Xiaoqin Sun**, Svetlana Stevovic, Jian Chen. Energy-efficiency gain by combination of PV modules and Trombe wall in the low-energy building design. *Energy and Buildings* 152 (2017) 568-576. (SCI, IF: 4.599)
10. **Xiaoqin Sun**, Linfeng Zhang, Shuguang Liao. Performance of a thermoelectric cooling system integrated with a gravity-assisted heat pipe for cooling electronics. *Applied Thermal Engineering* 116(2017) 433-444. (SCI, IF: 3.634)
11. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Yingjun Liu, Shuguang Liao. A study on the use of phase change materials (PCMs) in combination with a natural cold source for space cooling in telecommunications base stations (TBSs) in China. *Applied Energy* 117(2014): 95-103. (SCI, IF: 5.746) ESI-3%
12. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Shuguang Liao. Performance of a free-air cooling system for telecommunications base stations using phase change materials (PCMs): In-situ tests. *Applied Energy* 147(2015) 325-334. (SCI, IF: 5.746)

13. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Kyoung Ok Lee. Experimental observations on the heat transfer enhancement caused by natural convection during melting processes of solid-liquid phase change materials (PCMs). *Applied Energy* 162(2016) 1453-1461. (SCI, IF: 5.746) ESI-1%
14. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Kyoung Ok Lee. Energy and economic analysis of a building enclosure outfitted with a phase change material board (PCMB). *Energy Conversion and Management* 83(2014) 73-78. (SCI, IF: 4.801)
15. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Kyoung Ok Lee, Shuguang Liao. Parameter design for a phase change material board installed on the inner surface of building exterior envelopes for cooling in China. *Energy Conversion and Management* 120(2016) 100-108. (SCI, IF: 4.801)
16. **Xiaoqin Sun**, Yanjia Yang, Hongliang Zhang, Huiwei Si, Liang Huang, Shuguang Liao, Xiaosong Gu. Experimental research of a thermoelectric cooling system integrated with gravity assistant heat pipe for cooling electronic devices. *Energy Procedia* 105(2017) 4909-4914.
17. **Xiaoqin Sun**, Quan Zhang, Yingjun Liu, Hongxing Yang, Linfeng Zhang, Shuguang Liao. Numerical calculation and simulation on melting and solidification time periods of a phase change material. *Advanced Materials Research* 455-456(2012) 374-381. (EI: 20120814795659)
18. **Xiaoqin Sun**, Quan Zhang, Shuguang Liao, Jie Shen. The research on energy saving potential of phase change energy storage air conditioner in base stations. *Proceedings of ISHVAC 2011: Power and energy system* 3(2011) 763-769. (EI: 2012815453092)
19. **Xiaoqin Sun**, Junli Zhou, Wei Shen, Chang Peng, Guoqiang Zhang, Ling Zhang. Estimating natural-ventilation potential considering thermal mass. *2010 International Conference on Digital Manufacturing & Automation* (2011) 666-669. (EI: 20110813694989)
20. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Kyoung Ok Lee. On the natural convection enhancement of heat transfer during phase transition processes of solid-liquid phase change materials (PCMs). *Energy Procedia* 61(2014) 2062-2065.
21. **Xiaoqin Sun**, Quan Zhang, Mario A. Medina, Kyoung Ok Lee. Energy and economic analysis on building envelope with phase change material in summer. *APEC conference on low carbon town and physical energy storage* (2013) 617-622.
22. Hengyu Zhang, **Xiaoqin Sun**, Quan Zhang, Shuguang Liao, Yecong He. Estimating the Adaptability of Phase Change Material Board on Building Envelope of Telecommunications Base Stations. *Procedia Engineering* 121 (2015) 1665-1673.
23. Er Shi, **Xiaoqin Sun**, Yecong He, Changwei Jiang. Effect of a magnetic quadrupole field on entropy generation in thermomagnetic convection of paramagnetic fluid with and without a gravitational field. *Entropy* (2017) 19, 96.
24. **Xiaoqin Sun**, Youhong Chu, Yajing Mo, Siyuan Fan, Shuguang Liao. Experimental investigations on the heat transfer of melting phase change material (PCM). *Energy Procedia* 00 (2018) 000-000.
25. **Xiaoqin Sun**, Mario A. Medina, Kyoung Ok Lee, Xing Jin. Thermal performance of building frame walls outfitted with encapsulated PCM under full weather conditions. *1st International Conference on New Horizons in Green Civil Engineering (NHICE-01)*, Victoria, BC, Canada, April 25-27, 2018.
26. Kyoung Ok Lee, Mario A Medina, Erik Raith, **Xiaoqin Sun**. Assessing the integration of a thin phase change material (PCM) layer in a residential building wall for heat transfer reduction and management. *Applied Energy* (2015) 137: 699-706.

(SCI, IF: 4.781) ESI-HCP

27. Kyoung Ok Lee, Mario A Medina, **Xiaoqin Sun**. On the use of plug-and-play walls (PPW) for evaluating thermal enhancement technologies for building enclosure: evaluation of a thin phase change material (PCM) layer. *Energy and Building* (2015) 86: 86-92. (SCI, IF: 2.381)
28. Kyoung Ok Lee, Mario A Medina, **Xiaoqin Sun**. Development and verification of an EnergyPlus-based algorithm to predict heat transfer through building wall integrated with phase change materials (PCM). *Journal of Building Physics* (2016) 40: 77-95. (SCI, IF:1.027)
29. Kyoung Ok Lee, Mario A Medina, **Xiaoqin Sun**, Xing Jin. Thermal performance of phase change materials (PCM)-enhanced cellulose insulation in passive solar residential building walls. *Solar Energy* 163(2018) 113-121. (SCI, IF: 4.739)
30. Li Yantong, Zhang Quan, **Sun Xiaoqin**, Du Yaxing, Liao Shuguang. Optimization on Performance of the Latent Heat Storage Unit (LHSU) in Telecommunications Base Stations (TBSs) in China. *Energy Procedia* 75(2015) 2119-2124.
31. Xiaofeng Zhang, Xiaobo Liu, **Xiaoqin Sun**, Changwei Jiang, Hongqiang Li, Quanbin Song, Jing Zeng, Guoqiang Zhang. Thermodynamic and economic assessment of a novel CCHP integrated system taking biomass, natural gas and geothermal energy as co-feeds. *Energy Conversion and Management* 172(2018) 105-118.
32. Chuanchang Li, Baoshan Xie, Jian Chen, Zhongsheng Chen, **Xiaoqin Sun**, Stuart W. Gibb. H₂O₂-microwave treated graphite stabilized stearic acid as a composite phase change material for thermal energy storage. *RSC Advances* 7(2017) 52486-52495.
33. Jovanovic J., **Sun X.**, Cekic Z., Koprivica S. (2020) Sustainable Innovation in Architectural Design. In: Karabegović I. (eds) *New Technologies, Development and Application II*. NT 2019. Lecture Notes in Networks and Systems, vol 76. Springer, Cham. DOI https://doi.org/10.1007/978-3-030-18072-0_86
34. **Xiaoqin Sun**, Siyuan Fan, Youhong Chu, Yajing Mo, Shuguang Liao. Annual thermal evaluation of lightweight building envelopes containing phase change materials in Changsha. *ISHVAC* 2019.
35. Yuan Zhang, **Xiaoqin Sun**, Mario A. Medina. Calculation of transient phase change heat transfer through building envelopes: an improved enthalpy model and error analysis. *Energy and Buildings* 209 (2020) 109673.

Patents

1. Quan Zhang, **Xiaoqin Sun**, Yingjun Liu, Shuguang Liao, Haifeng Zhang, Lishuang Cheng. Energy storage unit and its heat transfer mechanism within three fluids. 2013.11, ZL201210002250.X
2. **Xiaoqin Sun**, Quan Zhang, Li Ling, Xiaoming Chen, Shuguang Liao, Yaning Wu, Liping Wang. A heat pipe system with energy storage. 2014.3, ZL201310737432.6
3. **Xiaoqin Sun**, Shuguang Liao, Hongliang Zhang, Yanjia Yang, Huiwei Si, Liang Huang. Thermoelectric cooling device coupled with heat pipe. 2017.8, ZL201610012556.1

Funded Research/Projects

1. Chip-level cooling technology with distributed phase change energy storage for data center
Source: Ministry of Science and Technology of China
Period: November 1, 2019 – October 31, 2022
2. Thermal behavior of a self-adaptive building envelope and its application
Source: Department of Science and Technology of Hunan
Period: January 1, 2019 – December 31, 2021
3. Dynamic heat transfer mechanism of phase change material in the presence of heat conduction and convection
Source: National Natural and Science Foundation (China).
Period: January 1, 2017 - December 31, 2019
4. International research of physical energy storage cooling system and demonstration
Source: National Science and technology Ministry
Period: April 1, 2015-March 31, 2018
(Co-Principal Investigator)
5. Research on the application of physical energy storage technology with renewable energy in a low carbon town
Source: Asia-Pacific Economic Cooperation (APEC)
Period: 2012-2013
(Co-Principal Investigator)
6. Heat transfer enhancement of phase change material based on the moving heat source and Lattice-Boltzmann models
Source: The Education Department of Hunan Province.
Period: September 1, 2015-August 31, 2018
7. Micro-mechanism on the heat transfer of solid-liquid phase change material based on the Lattice-Boltzmann method
Source: Hunan National Natural and Science Foundation.
Period: January 1, 2016-December 31, 2018