硕士研究生指导教师简介

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| 姓名（中文/汉语拼音） | **姚万祥/Yao Wanxiang** |  |
| 职称 | 教授 |
| 年龄 | 40 |
| 所在学院（系、所） | 建筑学院 |
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| **主要研究方向：** |
| 建筑节能及可再生能源利用，室内热环境及人体热舒适，建筑光环境与自然采光，健康建筑与室内污染物控制，生物气溶胶与人体健康，气候变化应对及影响，能源-经济-环境耦合影响 |
| **主要学历** |
| 2002-2006年 毕业于南京工业大学 建筑环境与设备工程 专业，获学士学位2007-2009年 毕业于天津城建大学 供热、供燃气、通风及空调工程专业，获硕士学位2009-2014年 毕业于同济大学 供热、供燃气、通风及空调工程专业，获博士学位 |
| **主要学术经历** |
| 　　【国内经历】2023.9-至今：青岛理工大学，教授2018.12-2023.8：天津城建大学能源与安全工程学院，副教授2018.12-2022.3：天津城建大学科技处，科长2019.10-2021.11：天津大学机械工程学院，博士后　　【国外经历】2022.5-2023.5：日本北九州市立大学，访问学者 |
| **主要讲授课程** |
| 《建筑设备》、《供热工程》、《暖通空调新技术》、《建筑节能》、《冷热源优化配置》、《研究生写作指导》等 |
| **主要学术兼职** |
| 担任Progress in Energy & Fuels期刊编委，Energy、Applied Energy、Energy Conversion and Management、Journal of Cleaner Production、Sustainable Cities and Society、Journal of Environmental Management、Renewable Energy、Energy and Buildings、Journal of Building Engineering、Journal of Cleaner Production等30多个SCI期刊审稿人。 |
| **主要学术成就、奖励及荣誉** |
| 山东省泰山学者青年专家、天津市131人才工程第二层次人选、印度尼西亚ITS' World Class Professor (WCP-Like)世界知名教授（2023年中国唯一）；获批2019年天津市科技进步奖二等奖《太阳能高效利用及智能检测关键技术研究与应用》（排名第一），获批2020年中国铁路工程集团有限公司科学技术奖一等奖《地下综合交通枢纽环境控制综合技术研究与示范》（排名第五）。受邀以分会场主席身份主持印尼泗水理工大学承办的国际会议，在第二届华人能源与人工环境国际学术会议(CEBE2021)作分会场报告，第三届华人能源与人工环境国际学术会议(CEBE2023)作邀请报告。 |
| **主要科研项目及角色** |
| 　　【在研项目】1. 国家自然科学基金项目，52178083，各向异性太阳辐射透射特性及对建筑得热的影响机理研究，2022.01-2025.12，58万元，在研，主持；
2. 天津市自然科学基金项目，22JCZDJC00750，基于纳米流体的热管式太阳能光伏/光热系统光谱吸收特性及传热机理研究，2022.10-2025.09，20万元，在研，主持。

　　【完成项目】1. 国家自然科学基金项目，51508372，基于雾霾散射-削弱效应的太阳辐射对建筑得热及能耗的影响机理研究，2016.01-2018.12，24万元，已结题，主持；
2. 国家自然科学基金项目，51278349，城市各向异性散射辐射与遮阳对建筑得热的影响，2013.01-2016.12，76万元，已结题，参加；
3. 国家自然科学基金项目，51208363，东南沿海地区高层建筑遮阳一体化技术设计方法研究，2013.01-2015.12，25万元，已结题，参加；
4. 天津市自然科学基金项目，17JCYBJC22100，基于雾霾散射-削弱效应的各向异性天空亮度分布及其对建筑光环境的影响机理研究，2017.04-2019.09，10万元，已结题，主持；
5. 天津市科委企业科技特派员项目，17JCTPJC52700，雾霾影响下太阳能光伏系统能效提升关键技术研究，2017.10-2018.09，5万元，已结题，主持；
6. 天津市科委科普项目，18KPHDSF00170，太阳能的资源分布、检测及其应用科普知识普及，2018.10-2019.09，8万元，已结题，主持；
7. 能源清洁利用国家重点实验室（浙江大学）开放基金课题，ZJUCEU2020024，基于微管径热管阵列的太阳能光伏/光热一体化系统能源转换机理研究，2021.01-2022.12，6万元，已结题，主持；
8. 浙江省太阳能利用及节能技术重点实验室开放课题，ZJS-OP-2020-02，基于耐候性原理的积尘对太阳能光伏系统能效的影响机理研究，2021.01-2022.12，7万元，已结题，主持；
9. 建筑安全与环境国家重点实验室开放基金资助项目，BSBE2015-09，太阳能薄膜电池与建筑一体化优化配置及节能运行策略研究，2015.08-2017.07，3万元，已结题，主持；
10. 亚热带建筑科学国家重点实验室开放研究基金项目，2017ZB16，雾霾对各向异性天空亮度分布的影响机理研究，2017.01-2018.12，3万元，已结题，主持；
11. 天津市建委科技项目，2017-9，各向异性太阳散射辐射测试关键技术研究与应用，2017.11-2019.06，18万元，已结题，主持；
12. 天津市建设系统软课题项目，2015-软7，基于模拟技术的建筑能耗快速评估方法研究，2015.10-2016.09，1万元，已结题，主持；
13. 天津市建委科技项目，2017-39，新型通水式辐射地板热工特性与舒适性研究，2017.07-2019.06，18万元，已结题，参加；
14. 天津市建委科技项目，2015-19，新型太阳能被动式利用技术——热管植入式墙体的研究与开发，2015.07-2017.06，15万，已结题，参加.
 |
| **代表性论文/论著及检索情况** |
| 【出版著作与教材】1. 姚万祥，李峥嵘，张志刚，太阳辐射模型及其应用[M]，北京：科学出版社，2022年2月
2. 张志刚，姚万祥，张伟，热管置入式墙体研究及应用[M]，北京：中国建筑工业出版社，2024年1月

【发表论文】已在国内外学术刊物发表学术论文67余篇，主要包括：1. Wanxiang Yao (姚万祥)\*, Mengjia Song, Xianli Li, Xi Meng, Yan Wang, Xiangru Kong, Jinming Jiang. A new modified method of all-sky radiance distribution based on the principle of photothermal integration. Applied Energy. 2024, 367:123480. (SCI一区)
2. Wanxiang Yao (姚万祥)\*, Mengjia Song, Yu Huang, Puyan Xu, Xianli Li, Gang Su, Weijun Gao. A new anisotropic solar radiation model based on the principle of photothermal integration. Renewable Energy. 2024, 226: 120436. (SCI一区)
3. Chunze Liu, Wanxiang Yao (姚万祥)\*, Jiajun Dong, Wanfeng Tian, Jiacheng Shang, Puyan Xua, Weijun GaoNew distribution models of the transmitted solar radiation on building interior surfaces. Journal of Building Engineering. 2024, 87: 108952. (SCI一区)
4. Chao Wang, Mengmeng Hou, Wanxiang Yao (姚万祥)\* \*, Weijun Gao, Fulin Jia, Tianhui Wang. Research on indoor thermal environment evaluation and thermal adaptation in winter of Japanese wood-framed detached houses. Case Studies in Thermal Engineering. 2024, 55: 104126. (SCI二区)
5. Wanxiang Yao (姚万祥)\*, Qi Yue, L. Cao, Lijie Ren, Leijie Jiang, Xiang Kong\*\*, Weijun Gao. The impact of spectral distribution on photovoltaic power generation and its quantitative evaluation model. Applied Energy. 358 (2024) 122581. (SCI一区)
6. Zhengrong Jiang, Weijun Gao, Wanxiang Yao (姚万祥)\*. Research on the wind environment in an enclosed courtyard: Effect of the opening position, size and wind angle. Urban Climate. 52 (2023) 101737. (SCI二区)
7. Wanxiang Yao (姚万祥)\*, Xiangru Kong, Jie Xu, Leijie Jiang, Wanfeng Tian, Weijun Gao. New solar radiation transmittance models of transparent envelope based on spectral splitting and their influence on building heat gain [J]. Journal of Building Engineering. 2023, 76: 107291. (SCI二区)
8. Yi Liu, Wanxiang Yao (姚万祥)\*, Weijun Gao. Thermal environment evaluation and thermal comfort zone deviation ——a case study of Chinese seaweed house in summer. Journal of Building Engineering. 78 (2023) 107703. (SCI二区)
9. Chunze Liu, Wanxiang Yao (姚万祥)\*, Jiajun Dong, Wanfeng Tian, Jiacheng Shang, Puyan Xua, Weijun Gao. New distribution models of the transmitted solar radiation on building interior surfaces. Journal of Building Engineering. 2024, 87: 108952. (SCI二区)
10. Wanxiang Yao (姚万祥)\*, Chunze Liu, Xiangru Kong, Zhigang Zhang, Yan Wang, Weijun Gao. A systematic review of heat pipe applications in buildings [J]. Journal of Building Engineering. 2023, 76: 107287. (SCI二区)
11. Fan Fei, Luyao Wang, Yan Wang, Wanxiang Yao (姚万祥)\* , Hiroatsu Fukuda\*\*, Yuling Xiao, Lei Tian, Tongtong Ji. A new method for evaluating the synergistic effect of urban water body and vegetation in the summer outdoor thermal environment [J]. Journal of Cleaner Production. 2023, 414: 137680. (SCI二区)
12. Yan Wang, Qiwei Dong, Huikun Guo, Liyuan Yin, Weijun Gao, Wanxiang Yao (姚万祥)\*, Lixin Sun. Indoor thermal comfort evaluation of traditional dwellings in cold region of China: A case study in Guangfu Ancient City [J]. Energy and Buildings. 2023, 288: 113028. (SCI二区)
13. Chen Xu, Yan Wang\*, Jinghao Hui, Luyao Wang, Wanxiang Yao (姚万祥)\*\*, Lixin Sun. Study on winter thermal environmental characteristics of the atrium space of teaching building in China's cold region [J]. Journal of Building Engineering. 2023, 67: 105978. (SCI二区)
14. 张志刚，刘莹，姚万祥\*，空气源热泵热水器在寒冷地区冬季的能效分析，太阳能学报，2023年1月。(EI)
15. 张志刚，苏珂，姚万祥\*，热管置入式墙体在实际建筑中的传热特性研究，太阳能学报，2022年10月。(EI)
16. Wanxiang Yao (姚万祥)\*, Xiangru Kong, Ai Xu, Puyan Xu, Yan Wang, Weijun Gao. New models for the influence of rainwater on the performance of photovoltaic modules under different rainfall conditions [J]. Renewable and Sustainable Energy Reviews.2023,173:113119. (SCI一区)
17. Wanxiang Yao (姚万祥)\*, Xiaorui Li, Weixue Cao, Guodong Li, Lijie Ren, Weijun Gao. Research on the influence of indoor thermal environment and activity levels on thermal comfort in protective clothing [J]. Energy and Buildings. 2022, 279: 112681. (SCI二区)
18. Wanxiang Yao (姚万祥)\*, Xiangru Kong, Xiao Han, Yan Wang, Jingfu Cao, Weijun Gao. Research on the efficiency evaluation of heat pipe PV/T systems and its applicability in different regions of China [J]. Energy Conversion and Management. 2022, 269: 116136. (SCI一区)
19. Wanxiang Yao (姚万祥)\*, Xiao Han, Yu Huang, Zhimiao Zheng, Yan Wang, Xiao Wang. Analysis of the influencing factors of the dust on the surface of photovoltaic panels and its weakening law to solar radiation -A case study of Tianjin [J]. Energy. 2022, 256: 124669. (SCI一区)
20. Zhigang Zhang, Qiaoli Liu, Wei Zhang, Wanxiang Yao (姚万祥)\*. Research on temperature distribution characteristics and energy saving potential of wall implanted with heat pipes in heating season [J]. Renewable Energy. 2022, 195: 1037-1049. (SCI一区)
21. Wanxiang Yao (姚万祥)\*, Kang Zhang, Weixue Cao\*, Xianli Li, Yan Wang, Xiao Wang. Research on the correlation between solar radiation and sky luminance based on the principle of photothermal integration [J]. Renewable Energy. 2022, 194: 1326-1342. (SCI一区)
22. Zhigang Zhang, Yu Wang, Wanxiang Yao (姚万祥)\*, Feng Gao, Chunhui Shou. Effect of thermo-physical parameters on heat transfer characteristics of the wall implanted with heat pipes[J]. Applied Thermal Engineering. 2022, 210:118375. (SCI二区)
23. Wanxiang Yao (姚万祥)\*, Wanfeng Tian, Jiacheng Shang, Haiyan He, Jiajun Dong, Weixue Cao. Distribution Characteristics of Transmitted Diffuse Solar Radiation on the Indoor Surface [J]. Journal of Thermal Science. 2021, 31:1939-1947. (SCI三区)
24. 24. Gang Su, Shuangyang Zhang, Wanxiang Yao (姚万祥)\*, Mengru Hu, Haodong Hao. Study on the evaluation method of diffuse radiation models——taking 5 typical cities in China as examples [J]. Energy and Built Environment. 2023, 4: 236-243.
25. Gang Su, Shuangyang Zhang, Mengru Hu, Wanxiang Yao (姚万祥)\*, Ziwei Li, Yue Xi. The modified layer-by-layer weakening solar radiation models basedon relative humidity and air quality index [J]. Energy. 2021, 239: 122488. (SCI一区)
26. Zhigang Zhang, Ming Wu, Wanxiang Yao (姚万祥)\*. Performance of the wall implanted with heat pipes on indoor thermal environment [J]. Indoor and Built Environment. 2021, 31(4): 878-894.（SCI三区）
27. Wanxiang Yao(姚万祥)\*, Chunfeng Xu, Shujie Pan. Reply to the letter on the clear-sky ASHRAE radiation model related to [The modified ASHRAE model based on the mechanism of multi-parameter coupling][J]. Energy Conversion & Management. 2020; 214: 112823. (SCI一区)
28. Wanxiang Yao (姚万祥)\*, Chunfeng Xu, Jun Zhao, Xiao Wang, Yan Wang, Xianli Li, Jingfu Cao. The modified ASHRAE model based on the mechanism of multi-parameter coupling[J]. Energy Conversion and Management. 2020, 209: 112642. (SCI一区)
29. Wanxiang Yao (姚万祥)\*, Zhimiao Zheng, Jun Zhao, Xiao Wang, Yan Wang, Xianli Li, Jidong Fu. The factor analysis of fog and haze under the coupling of multiple factors -- taking four Chinese cities as an example[J]. Energy Policy. 2020, 137: 111138. （SCI一区）
30. Qun Zhao, Wanxiang Yao (姚万祥)\*, Chunxiao Zhang\*, Xiao Wang, Yan Wang. Study on the influence of fog and haze on solar radiation based on scattering-weakening effect. Renewable Energy. 2019; 134: 178-185.（SCI一区）
31. Wanxiang Yao (姚万祥), Chunxiao Zhang\*, Haodong Hao, Xiao Wang, Xianli Li. A support vector machine approach to estimate global solar radiation with the influence of fog and haze. Renewable Energy. 2018; 128: 155-162.（SCI一区）
32. Wanxiang Yao (姚万祥), Chunxiao Zhang\*, Xiao Wang, Zhigang Zhang, Xianli Li, Hanyu Di. A new correlation between global solar radiation and the quality of sunshine duration in China. Energy Conversion & Management. 2018; 164: 579-587.（SCI一区）
33. Wanxiang Yao (姚万祥)\*, Chunxiao Zhang, Xiao Wang, Jingsi Sheng, Yanbiao Zhu, Suli Zhang. The research of new daily diffuse solar radiation models modified by air quality index (AQI) in the region with heavy fog and haze. Energy Conversion and Management. 2017; 139: 140-150.（SCI一区）
34. Wanxiang Yao (姚万祥)\*, Zhengrong Li, Xiao Wang, Qun Zhao, Zhigang Zhang, Lin Lin. A simplified model exploration research of new anisotropic diffuse radiation model. Energy Conversion and Management. 2016; 126: 724-735.（SCI一区）
35. Wanxiang Yao (姚万祥), Zhengrong Li\*, Tongbin Xiu, Yuan Lu, Xiaobiao Li. New decomposition models to estimate hourly global solar radiation from the daily value. Solar Energy. 2015；120：87-99.（SCI二区）
36. Wanxiang Yao (姚万祥)\*, Zhengrong Li. Reply to “On the correct use of the Gueymard diffuse radiation model for tilted surfaces” by Christian A. Gueymard. Energy Conversion and Management. 2015；101：789-794.（SCI一区）
37. Wanxiang Yao (姚万祥), Zhengrong Li\*, Yuyan Wang, Fujian Jiang, Lingzhou Hu. Evaluation of global solar radiation models for Shanghai, China [J]. Energy Conversion and Management. 2014；84：597–612.（SCI一区）
38. Wanxiang Yao (姚万祥), Zhengrong Li\*, Qun Zhao, Yuan Lu, Ruiyang Lu. A new anisotropic diffuse radiation model [J]. Energy Conversion and Management.2015；95：304-313.（SCI一区）
39. 姚万祥，李峥嵘\*，赵群，等。几种散射辐射模型精度的对比[J]. 同济大学学报(自然科学版). 2014；42：937-943.（EI）
40. 李峥嵘，姚万祥\*，赵群，等。水平面日太阳散射辐射模型对比研究[J]. 太阳能学报. 2013；34：794-799.（EI）
41. 姚万祥\*，李峥嵘，陆瑞阳，等。基于各向异性太阳辐射的遮阳控制策略研究[J].西安建筑科技大学学报(自然科学版). 2013(05)：681-687（CSCD）
42. 姚万祥\*，李峥嵘，李翠，等。各种天气状况下太阳辐射照度与太阳光照度关系[J]. 同济大学学报(自然科学版). 2013；41：784-788（EI）
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