

SOM S. SHRESTHA

Senior R&D Staff
Building Envelope Materials Research Group
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EDUCATION

- PhD in Mechanical Engineering** 2009
Iowa State University
Dissertation: *Performance evaluation of carbon-dioxide sensors used in building HVAC applications*
Advisors: Prof. Gregory Maxwell
- MS in Mechanical Engineering** 2006
Iowa State University
Thesis: *Empirical Validation of Building Energy Simulation Software: EnergyPlus*
Advisors: Prof. Gregory Maxwell
- MS in Mechanical Engineering** 1994
Odessa State Academy of Refrigeration, Ukraine

RESEARCH EXPERTISE

- Active building envelopes.
- High-performance thermal insulation materials.
- Thermal energy storage systems.
- HVAC and appliances.
- Building energy simulations.
- Weatherization of energy infrastructure.

RESEARCH OUTPUT METRICS

h-index (Scopus/Google)	20/25
h5-index/i10-index (Scopus/Google)	13/50
Citations (Scopus/Google)	1239/2138
Career publications (Scopus/Google)	80/183
SciVal citations per publication	11.9
SciVal field-weighted citation impact	1.26
Granted patents	1
Nonprovisional patent applications	8

PROJECT FUNDINGS FROM

- US Department of Energy
- US Department of Defense

- Air Barrier Association of America (ABAA)
- BP America
- Dow Olympics & Sports solutions
- Cellulose Insulation Manufacturers Association
- Bayer Material Science LLC (now Covestro)
- R&D Services, Inc.
- Structa Wire Corp
- NatureWorks
- Bristol Compressors International, LLC
- Kingspan Insulation

REVIEWED FUNDING PROPOSALS FOR

- US Department of Energy.
- US Department of Defense.
- Advanced Research Projects Agency–Energy (ARPA-E).
- New York State Energy Research and Development Authority (NYSERDA).
- Research Grants Council of Hong Kong.

PROFESSIONAL EXPERIENCE

Senior R&D Staff | Building Envelope Materials Research

2022–Present

Oak Ridge National Laboratory

- Managing 8 major projects as PI in four critical areas:
 1. High-performance thermal insulation materials,
 2. Active building envelope systems,
 3. Thermal energy storage technologies, and
 4. Weatherization of energy infrastructure to enhance resilience.
 - Ensure that project deliverables are completed on time and within budget.
 - Coordinate with internal and external project collaborators.
- Managing \$3.7M in FY25 that includes \$2.6M in new funding.
- Managing 3 subcontracts:
 - The University of Utah.
 - Rincon Consulting LLC.
 - DRG Tech Solutions.
- Managing 2 CRADA projects.
 - Metal Construction Association (MCA).
 - Panda Biotech.
- Recently developed technologies:
 - High-Performance Thermal Insulation Materials – achieved 30% better performance compared to the state-of-the-art.
 - Thermally Anisotropic Building Envelope (TABE) which can actively manages heat transfer through building envelopes to tailor HVAC load on demand.
 - State-of-charge sensor (SOC) for phase-change materials-based TES systems to optimize the use of stored energy.
 - Heat exchangers for TES systems to maximize power and energy density.
 - Transient infrared imaging for non-intrusive, low-cost, fast, and accurate air leakage detection.
- Contributing as a Co-PI on three additional projects

- Hire and mentor early-career professionals
 - Guide them in technical skills needed for their research area.
 - Provide career development guidance.
 - Assist with funding identification and proposal writing.
 - Serve on PhD committees.
 - Guide PhD student as a main advisor.
- Disseminate ORNL’s work through publications and presentations at professional societies.

R&D Staff Building Envelopes Oak Ridge National Laboratory	2014–2021
Associate R&D Staff Building Envelopes Oak Ridge National Laboratory	2009–2013
Graduate Research Assistant Industrial Assessment Center, Iowa State University	2004–2009
Mechanical & Materials Manager, Himal Hydro and General Construction Ltd., Nepal	1996–2004
Lecturer, Tribhuvan University, Purwanchal Engineering Campus, Nepal	1994 – 1996
Refrigeration Technician Expanded program on immunization	1987 – 1989

AWARDS

- 2025 R&D 100 Award - Next-Gen High-Performance Polyiso Foam Insulation
- 2025 **ASHRAE Exceptional Service Award**
- 2025 **ASHRAE Fellow**
- 2024 R&D 100 Award Finalist—Heat Exchanger for Low-Conductivity Phase Change Materials
- 2023 **BTSD Outstanding Mentor Award**
- 2022 ABAA Industry Partner Award
- 2021 ASME Certification of Appreciation for organizing International Mechanical Engineering Congress & Exposition
- 2018 ASHRAE Technical Paper Award
- 2016 ASHRAE Distinguished Service Award
- 2008 Iowa State University Teaching Excellence Award
- 2008 Iowa State University Graduate and Professional Student Senate Research Award

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

ASHRAE (formerly American Society of Heating, Refrigerating and Air-Conditioning Engineers) member since 2004

- Elevated to **Fellow member** in 2005
- **2025 ASHRAE Winter Conference Technical Program Chair.**
- Conference and Exposition Committee member 2020 – 2025.

- 2024-25 AHRI/ASHRAE Joint Exposition Policy Committee member.
- 2010-2025 ASHRAE-certified Building Energy Modeling Professional (BEMP)
- 2021 – 2025 Paper Submission Ad Hoc Committee member.
- **Conference Track Chair:**
 - 2024 ASHRAE Winter Conference: Decarbonization and Climate Change.
 - 2023 ASHRAE Winter Conference: Pathways to Zero Energy Emissions and Decarbonization.
 - 2022 ASHRAE Winter Conference: Environmental Health and IEQ in the International Arena.
- **Technical Paper Session Chair:**
 - 2025 ASHRAE Annual Conference: Energy Storage and Control.
 - 2025 ASHRAE Annual Conference: Building Energy Use and Grid-Interaction.
 - 2025 ASHRAE Winter Conference: Advancements in Air Filtration, Cleaning and Contaminant Analysis.
 - 2024 ASHRAE Annual Conference: Fundamentals and Application of IAQ.
 - 2024 ASHRAE Winter Conference: Advancements in Fluid Flow Measurement, Lunar Energy Harvesting, Urban Building Energy Modeling and Real-Time HVAC Control.
 - 2022 ASHRAE Winter Conference: Addressing IEQ Challenges Through CFD Simulations, Air Cleaning Technologies and Advanced Particle Removal Technology.
 - 2022 ASHRAE Winter Conference: Innovation in Closed Cavity Façade, Double Skin Façade and Drying Air Cavity.
 - 2021 ASHRAE Winter Conference: Best Practices for Building Envelopes and HVAC in Extreme Climates.
- **Seminar chair:**
 - 2018 ASHRAE Annual Conference: Convective Vs. Radiant Load Calculations: Are They Different?
- **Technical committees:**
 - Voting member of technical committee 1.02 Instruments & Measurements from 7/1/20 to 6/30/24
 - Voting member of technical committee 04.01 Load Calculation Data and Procedures from 7/1/12 to 6/30/16
 - Research Subcommittee Chair of technical committee 04.01 Load Calculation Data and Procedures from 7/1/19 to 6/30/24
 - Program Subcommittee Chair of technical committee 04.01 Load Calculation Data and Procedures from 7/1/18 to 6/30/19
 - Voting member of ASHRAE Standard Project Committee (SPC) 203 that developed ANSI/ASHRAE Standard 203-2014 Method of Test for Determining Heat Gain of Office Equipment Used in Buildings.
 - Voting member of ASHRAE SPC 209 that developed ANSI/ASHRAE Standard 209-2018 Energy Simulation Aided Design for Buildings Except Low-Rise Residential Buildings.
 - Voting member of the project evaluation committee (PES) and project monitoring committee (PMS) of ASHRAE RP-1729 Experimental Verification of Cooling Load Calculations for Spaces with Non-Uniform Temperature Radiant Surfaces.
 - Voting member of the project evaluation committee (PES) and project monitoring committee (PMS) of ASHRAE RP-1681 Low Energy LED Lighting Heat Gain Distribution in Buildings.
 - An active member of several Technical Committees.

The American Society of Mechanical Engineers (ASME), member since 2004

- Member on K-20 (Computational Heat Transfer) Committee.

- ASME IMECE 2020 Topic Organizer Computational Methods to Develop Ultra-low/high Thermal Conductivity Materials II & Application of Machine Learning/Artificial Intelligence in Heat Transfer.
- ASME IMECE 2020 Topic Organizer Methods in Computational Heat Transfer & Computational Methods to Develop Ultra-low/high Thermal Conductivity Materials.

ASTM (formerly known as American Society for Testing and Materials)

- Significant contribution to develop ASTM Standard C1919-22 “Measurement of the Steady-State Thermal Transmission Properties of Small Specimens Using the Heat Flow Meter Apparatus.”
- ASTM C1784 Standard “Test Method for Using a Heat Flow Meter Apparatus for Measuring Thermal Storage Properties of Phase Change Materials and Products” Task Group member.
- Member of the Technical Committee for the ASTM Symposium “Changing Face of Building Materials and Systems in Response to Climate Change” 2025, Toronto.

International Building Performance Simulation Association (IBPSA), member since 2014.

American Association for the Advancement of Science (AAAS), member since 2017.

Invited panelist at the MIT Energy Conference, Energy Efficiency Panel, 2021.

PROFESSIONAL REGISTRATIONS

ASHRAE-certified Building Energy Modeling Professional (BEMP).

INTELLECTUAL PROPERTY

TECHNOLOGY LICENSING:

Thermally Anisotropic Building Envelope (TABE) -being licensed to ThermoVerse, LLC.

PATENTS GRANTED:

S Shrestha, K Biswas, D Hun, J Atchley. 2024. Thermally anisotropic composites for thermal management in building environments. US Patent 12,013,149.

NONPROVISIONAL PATENT APPLICATIONS

- 8 M Lamm, T Aytug, D Hun, K Li, S Shrestha. 2025. Insulation foam and methods of manufacturing the same. US Patent App. 18/761,762.
- 7 J Rendall, S Shrestha, Z Shen, A Tamraparni, D Hun. 2024. An optimized heat exchanger and methods for designing the same. US Patent App. 18/614,115.
- 6 D Hun, T Saito, Z Demchuk, S Shrestha, KPC Guzman. 2024. Plant sourced insulation foam. US Patent App. 18/646,199.
- 5 S Shrestha, HM Salonvaara, ED Iffa, N Kunwar, D Hun, PR Boudreaux, T Feng. 2023. Solid-state thermal switch panel for thermal storage. US Patent App. 18/369,500.
- 4 JD Rendall, S Shrestha, AC Gehl, JA Atchley, D Hun, Z Shen. 2024. State of charge sensor for phase change material thermal energy storage. US Patent App. 18/208,551.

- 3 D Hun, T Saito, JW Klett, TM Alexander, S Shrestha, RK Duncan, K Biswas, B Li. 2023. Polymeric shells and particles for vacuum insulation panels. US Patent App. 18/211,784.
- 2 D Hun, T Saito, JW Klett, TM Alexander, S Shrestha, RK Duncan, K Biswas, B Li. 2021. Polymeric vacuum insulation boards. US Patent App. 17/105,727.
- 1 S Shrestha, D Hun, J Atchley, K Biswas. Thermally anisotropic composites for thermal management in building envelopes. US Patent App. 16/849,070.

PROVISIONAL PATENT APPLICATIONS

S Shrestha, S Wanasinghe, Z Demchuk, A Tamraparni, C Gainaru, T Feng, J Tiwari, T Saito, D Hun. 2024. Design and Fabrication of High-Performance Polyisocyanurate-Based Foams. Provisional Patent 202405718.

INVENTION DISCLOSURES

- 17 S Shrestha, T Saito, D Hun, C Gainaru, Z Demchuk, A Tamraparni, S Wanasinghe. 2024. Design and fabrication of high-performance polyisocyanurate foams. Invention Disclosure 202405718.
- 16 S Shrestha, A Desjarlais, T Saito, D Hun, B Park, D Howard. 2023. Facers to increase initial thermal resistivity and reduce aging of foam insulations. Invention Disclosure 202305444.
- 15 J Rendall, S Shrestha, Z Shen, A Tamraparni, D Hun. 2023. Thermal energy storage fin and tube heat exchanger for low conductivity PCMs. Invention Disclosure 202305369.
- 14 Z Demchuk, D Hun, K Cortes Guzman, S Shrestha, T Saito. 2023. Low-carbon, recyclable, biobased foam insulation. Invention Disclosure 202305321.
- 13 M Lamm, T Aytug, K Li, D Hun, S Shrestha. 2023. Insulation foam enabled by synergistic foaming strategies. Invention Disclosure 202305288.
- 12 J Rendall, S Shrestha, Z Shen, D Hun. 2022. Heat exchanger for low conductivity PCMs. Invention Disclosure 202205231.
- 11 J Rendall, S Shrestha, J Atchley, A Gehl, D Hun. 2022. Modification of a heat flux meter apparatus to determine the thermal contact resistance of PCM materials that undergo large density change as a method to create models to determine the state of charge of PCM in the field. Invention Disclosure 202205102.
- 10 P Cheekatamarla, Vi Sharma, S Shrestha. 2021. Carbon dioxide as a thermal insulating medium in buildings. Invention Disclosure 202104803.
- 09 S Shrestha, T Feng, D Howard, D Hun, A Rai. 2021. ThermoPI: Thermal conductivity calculation application for porous thermal insulation materials. Invention Disclosure 202104780.
- 08 S Shrestha, T Feng, D Hun. 2021. Fast solid-state thermal switch with large ON/OFF ratio. Invention Disclosure 202004771.
- 07 S Shrestha, M Salonvaara, E Iffa, N Kunwar, D Hun, P Boudreaux, T Feng. 2020. Solid-State Thermal Switch Panel for Thermal Storage. Invention Disclosure 202004771.
- 06 D Hun, J Klett, T Saito, S Shrestha. 2020. Polymeric vacuum insulation boards. Invention Disclosure 202004565.
- 05 M Hu, A Lu, D Hun, S Shrestha. 2019. Bio-based PCMs for thermal energy storage. Invention Disclosure 201904400.
- 04 S Shrestha, J Atchley, K Biswas, D Hun. 2018. Thermally Anisotropic Composites for Thermal Management in Building Envelopes. Invention Disclosure Number: 201804225.
- 03 K Biswas, D Hun, J Klett, T Saito, S Shrestha. 2016. Polymeric Vacuum Insulation Spheres. Invention Disclosure 201603841.

- 02 K Biswas, D Hun, J Klett, T Saito, S Shrestha. 2016. Polymer-based micro-porous vacuum insulation using 3D printing. Invention Disclosure 201603833.
- 01 O Abdelaziz, K Gluesenkamp, A Momen, S Shrestha, E Vineyard. 2014. Heating-Cooling Bed integrated with the Smart Building's Heating/Air Conditioning Controller. Invention Disclosure 201403269.

JOURNAL EDITOR

- Special Issue Editor for ASHRAE's Science and Technology for the Built Environment (STBE) journal.
- Associate Editor Frontiers in Sustainable Cities.
- Guest editor for MDPI's Sustainability for a Special Issue "Experimental and Analytical Study of the Energy Performance of Building Envelope."

REVIEWED MANUSCRIPTS FOR

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| – ACEEE Summer Study | – Frontiers in Energy Research |
| – Applied Thermal Engineering | – IBPSA Building Simulation |
| – Applied Energy | – Journal of Architectural Engineering |
| – ASHRAE Conference | – Journal of Building Performance Simulation |
| – ASHRAE Transactions | – Journal of Building Physics |
| – ASME Journal of Solar Energy Engineering | – Journal of Cleaner Production |
| – ASME IMECE Conference | – Materials Today Communications |
| – ASTM Symposia | – NRCA Symposium |
| – Buildings Conference | – Science and Technology for the Built Environment |
| – Building and Environment | – Sustainability |
| – Energies | |
| – Energy and Buildings | |

JOURNAL PUBLICATIONS

- 49 S Wanasinghe, Z Demchuk, A Tamraparni, J Tiwari, T Feng, C Gainaru, B Park, S Kim, D Hun, T Saito, S Shrestha. Design and Fabrication of Polyisocyanurate Foams Toward Significantly Enhanced Thermal Resistivity. ACS Applied Engineering Materials. 3 (2025) 2087–2098.
- 48 A Tamraparni, J Rendall, Z Shen, D Hun, S Shrestha. Experimental investigation on phase change material-based finned tube heat exchanger for thermal energy storage and building envelope thermal management. Applied Thermal Engineering, 273 (2025) 126490.
- 47 Z Shen, D Howard, S Shrestha, D Hun, S Mumme. Coupling thermal energy storage with a thermally anisotropic building envelope for building demand-side management under various US climate conditions. Energy and Buildings 328 (2025) 115204.
- 46 J Rendall, Z Shen, A Tamraparni, D Hun, S Shrestha. Low-cost fin-tube heat exchanger design for building thermal energy storage using phase change material. International Communications in Heat and Mass Transfer 159 (2024) 108098.
- 45 R Zhang, Z Shen, B Park, T Feng, A Aldykiewicz, A Desjarlais, D Hun, S Shrestha. Natural Fibers as Promising Core Materials of Vacuum Insulation Panels. Construction and Building Materials 453 (2024) 138890.

- 44 D Howard, S Shrestha, Z Shen, T Feng, D Hun. Thermally Anisotropic Building Envelope for Thermal Management: Finite Element Model Calibration using Field Evaluation Data. *Journal of Building Performance Simulation*, 17(6), 756–775.
- 43 L Adua, A Asamoah, J Barrows, P Brookstein, B Chen, D Rucker, C Denzer, A Desjarlais, W Falconer, L Fernandes, D Fislser, C Foley, C Gaillard, A Gladen, M Guzowski, T Hill, D Hun, R Kishore, K Klingenberg, J Kosny, R Levinson, M McGinley, M Myer, J Nicodemus, A Rempel, J Riggins, R Riggs, B Robinson, X Ruan, R Schwarz, M Sharp, S Shrestha, M Sofos, P Tabares-Velasco, R Tenent, C Toye, T Usher, A Walker. Ambient Energy for Buildings: Beyond Energy Efficiency. *Solar Compass* 11 (2024) 100076.
- 42 S Shrestha, Z Demchuk, F Polo-Garzon, A Tamraparni, J Damron, D Howard, T Saito, A Sokolov, D Hun, C Gainaru. An experimental toolbox for the physical characterization of thermal insulating polymeric foams. *Helion* Volume 10, Issue 16, 30 August 2024, e36074.
- 41 J Marchante-Avellaneda, E Navarro-Peris, J Corberan, S Shrestha. Analysis of map-based models for reciprocating compressors and optimum selection of rating points. *International Journal of Refrigeration* 153 (2023) 168-183.
- 40 J Marchante-Avellaneda, E Navarro-Peris, J Corberan, S Shrestha. Comparison and selection of experimental designs for the characterization of scroll and reciprocating compressors: Adjustment of polynomial models with compact experimental samples. *Applied Thermal Engineering* 241 (2024) 122341.
- 39 E Iffa, M Salonvaara, N Kunwar, S Shrestha, P Boudreaux, D Hun. Development and performance evaluation of active insulation systems using solid-state thermal switches. *Science and Technology for the Built Environment*, 30(7), 822–832.
- 38 J Tiwari, S Shrestha, T Feng. Computational design of isotropic and anisotropic ultralow thermal conductivity polymer foams. *Journal of Building Engineering* 92 (2024) 109717.
- 37 T Feng, Z Shen, S Shrestha, D Hun. A novel transient infrared imaging method for non-intrusive, low-cost, fast, and accurate air leakage detection in building envelopes. *Journal of Building Engineering* 91 (2024) 109699.
- 36 N Kunwar, M Salonvaara, E Iffa, S Shrestha, D Hun. Performance assessment of active insulation systems in residential buildings for energy savings and peak demand reduction. *Applied Energy* 348 (2023) 121209.
- 35 Z Shen, S Shrestha, D Howard, T Feng, D Hun, B She. Machine learning–assisted prediction of heat fluxes through thermally anisotropic building envelopes. *Building and Environment* 234 (2023) 110157.
- 34 Z Shen, C Chen, H Zhou, N Fefferman, S Shrestha. Community vulnerability is the key determinant of diverse energy burdens in the United States. *Energy Research & Social Science* 97 (2023) 102949.
- 33 S Shrestha, J Tiwari, A Rai, D Hun, D Howard, A Desjarlais, M Francoeur, T Feng. Solid and gas thermal conductivity models improvement and validation in various porous insulation materials. *International Journal of Thermal Sciences* 187 (2023) 108164.
- 32 M Lamm, K Li, J Atchley, S Shrestha, S Mahurin, D Hun, T Aytug. Tailorable thermoplastic insulation foam composites enabled by porous-shell hollow glass spheres and expandable thermoplastic microspheres. *Polymer* 267 (2023) 125652.
- 31 J Marchante-Avellaneda, J Corberan, E Navarro-Peris, S Shrestha. A critical analysis of the AHRI polynomials for scroll compressor characterization *Applied Thermal Engineering* 219 (2023) 119432.
- 30 C Atkins, D Hun, P Im, B Post, B Slattery, E Iffa, B Cui, J Dong, A Barnes, J Vaughan, A Roschli, M Salonvaara, S Shrestha, S Jung, P Chesser, J Heineman, P Wang, A Jackson, M Lapsa. Empower Wall: Active insulation system leveraging additive manufacturing and model predictive control. *Energy Conversion and Management* 266 (2022) 115823.
- 29 B Cui, J Dong, S Lee, Pe Im, M Salonvaara, D Hun, S Shrestha. Model predictive control for active insulation in building envelopes. *Energy & Buildings* 267 (2022) 112108.

- 28 E Iffa, D Hun, M Salonvaara, S Shrestha. Performance evaluation of a dynamic wall integrated with active insulation and thermal energy storage systems. *Journal of Energy Storage* 46 (2022) 103815.
- 27 R Jogineedi, K Biswas, S Shrestha. Experimental Study of the Behavior of Phase Change Materials during Interrupted Phase Change Processes. *Energies* 2021, 14 (23), 8021.
- 26 Z Shen, A Brooks, Y He, S Shrestha, H Zhou. Evaluating dynamic thermal performance of building envelope components using small-scale calibrated hot box tests. *Energy and Buildings* 251 (2021) 111342.
- 25 A Rai, T Feng, D Howard, D Hun, M Zhang, H Zhou, S Shrestha. Conduction Heat Transfer through Solid in Porous Materials: A Comparative Study by Finite-Element Simulations and Effective Medium Approximations. *Computational Thermal Sciences* 13 (2021) 6.
- 24 Z Shen, H Zhou, S Shrestha. LCC-based framework for building envelope and structure co-design considering energy efficiency and natural hazard performance. *Journal of Building Engineering* 35 (2021) 102061.
- 23 T Feng, A Rai, D Hun, S Shrestha. Molecular dynamics simulations of energy accommodation between gases and polymers for ultra-low thermal conductivity insulation. *International Journal of Heat and Mass Transfer* 164 (2021) 120459.
- 22 T Feng, J He, A Rai, D Hun, J Liu, S Shrestha. Size Effects in the Thermal Conductivity of Amorphous Polymers. *Physical Review Applied* 14 (2020) 044023.
- 21 M Allen, A Rose, J New, O Omitaomu, J Yuan, M Branstetter, L Sylvester, M Seals, T Carvalhaes, M Adams, M Bhandari, S Shrestha, J Sanyal, A Berres, C Kolosna, K Fu, A Kahl. Impacts of the Morphology of New Neighborhoods on Microclimate and Building Energy Use. *Renewable & Sustainable Energy Reviews* 133 (2020) 110030.
- 20 A Trofimov, J Atchley, S Shrestha, A Desjarlais, H Wang. Evaluation of measuring thermal conductivity of isotropic and anisotropic thermally insulating materials by transient plane source (Hot Disk) technique. *Journal of Porous Materials* (2020) 27:1791–1800.
- 19 Y Hu, T Feng, X Gu, Z Fan, X Wang, M Lundstrom, S Shrestha, H Bao. Unification of nonequilibrium molecular dynamics and the mode-resolved phonon Boltzmann equation for thermal transport simulations. *Phys. Rev. B* 101, 155308 (2020).
- 18 K Biswas, S Shrestha, D Hun, J Atchley. Thermally anisotropic composites for improving the energy efficiency of building envelopes. *Energies* 2019, 12(19), 3783.
- 17 K Biswas, T Patel, S Shrestha, D Smith, A Desjarlais. Whole building retrofit using vacuum insulation panels and energy performance analysis. *Energy and Buildings* 203 (2019) 109430.
- 16 A Almalkawi, P Soroushian, S Shrestha. Evaluation of the Energy-Efficiency of an Aerated Slurry-Infiltrated Mesh Building System with Biomass-Based Insulation. *Renewable Energy* 133 (2019) 797-806.
- 15 N Hossienya, S Shrestha, O Owusua, M Natala, R Benson, A Desjarlais. Improving the Energy Efficiency of a Refrigerator-Freezer through the Use of a Novel Cabinet/Door Liner Based on Ingeo Polylactide Biopolymer. *Applied Energy* 235 (2019) 1-9.
- 14 M Bhandari, D Hun, S Shrestha, S Pallin, M Lapsa. A Simplified Methodology to Estimate Energy Savings in Commercial Buildings from Improvements in Airtightness. *Energies* 2018, 11(12), 3322.
- 13 B Shen, O Abdelaziz, S Shrestha, A Elatar. Model-Based Optimizations of Packaged Rooftop Air Conditioners Using Alternative Lower Global Warming Potential Refrigerants. *International Journal of Refrigeration* 87 (2018) 106-117.
- 12 O Abdelaziz, S Shrestha. Evaluation of Alternative Refrigerants for Mini-Split Air Conditioners. *ASHRAE Transactions* 2017, Vol. 123 Issue Part 1, p147-161.

- 11 K Biswas, S Shrestha, M Bhandari, A Desjarlais. Insulation materials for commercial buildings in North America: An assessment of lifetime energy and environmental impacts. *Energy and Buildings* 112 (2016) 256–269.
- 10 B Shen, S Shrestha, O Abdelaziz. Model validations for low-global warming potential refrigerants in mini-split air-conditioning units. *Science and Technology for the Built Environment* 22(8), 1254–1262.
- 09 O Abdelaziz, S Shrestha. Evaluating Alternative Refrigerants for High Ambient Temperature Environments. IEA Heat Pump Centre 1255681.
- 08 K Biswas, J Lu, P Soroushian, S Shrestha. Combined experimental and numerical evaluation of a prototype nano-PCM enhanced wallboard. *Applied Energy* 131 (2014) 517–529.
- 07 S Shrestha, K Biswas, A Desjarlais. A Protocol for Lifetime Energy and Environmental Impact Assessment of Building Insulation Materials. *Environmental Impact Assessment Review* 46 (2014) 25–31.
- 06 J Kosny, A Asiz, I Smith, S Shrestha, A Fallahi. A Review of High R-Value Wood Framed and Composite Wood Wall Technologies Using Advanced Insulation Techniques. *Energy and Buildings*, 72 (2014) Pages 441–456.
- 05 M Bhandari, S Shrestha, J New. Evaluation of weather datasets for building energy simulation. *Energy and Buildings* 49 (2012) 109-118.
- 04 S Shrestha, G Maxwell. An experimental evaluation of HVAC-grade carbon-dioxide sensors: part 4, effects of aging on sensor performance. *ASHRAE Transactions* 116 (2010) 412-423.
- 03 S Shrestha, G Maxwell. An experimental evaluation of HVAC-grade carbon-dioxide sensors: part 3, humidity, temperature, and pressure sensitivity test results. *ASHRAE Transactions* 116-1 (2010) 271-283.
- 02 S Shrestha, G Maxwell. An experimental evaluation of HVAC-grade carbon-dioxide sensors: part 2, performance test results. *ASHRAE Transactions* 116-1 (2010) 260-270.
- 01 S Shrestha, G Maxwell. An experimental evaluation of HVAC-grade carbon-dioxide sensors: part 1, test and evaluation procedure. *ASHRAE Transactions* 115-2 (2009) 471-483.

BOOK CHAPTER AND MAGAZINE ARTICLES

- 4 P Cheekatamarla, V Sharma, S Shrestha. *Advanced Nanomaterials and Their Applications in Renewable Energy, Chapter 1 - Energy-efficient building technologies*. 2022.
- 3 S Shrestha, A Desjarlais, D Howard, E Klonowski, J Letts, M Mazor, A Behr, S Phillips, E Baz. Climate benefits and building energy efficiency gains from improved roofing insulation in cold climates. *IIBEC Interface* Vol. 39, Issue 6, Pages 14-26
- 2 A Desjarlais, S Shrestha, M Bhandari, L Dalglish. Estimating the Energy, Economic, and Durability Benefits of Installing an Air Barrier System in Commercial Buildings Using a Web-Based Calculator. *IIBEC Interface* September 2019, Volume 37, No. 8, Pages 36-42.
- 1 D Hun, M Jackson, S Shrestha. Ventilation Energy Demands and Indoor Air Quality in High-Performance Homes. *IIBEC Interface*, Vol. 31, Issue 9, 2013.

CONFERENCE PAPERS

- 63 N Hmeidat, S Bullock, P Barnett, U Marathe, S Guzorek, S Shrestha, S Elyas, C Hartnett, P Rydin, A Hassen. Development and Sheet Molding Compound (SMC) of Polydimethylsiloxane Composites for Thermal Insulation Applications. 2025 American Society for Composites 39th Annual Technical Conference.

- 62 Z Shen, T Feng, J Tiwari, P Boudreaux, S Shrestha, D Hun. AI-assisted building envelope air leakage identification using transient infrared thermal imaging. 2025 ASHRAE Winter Conference.
- 61 J Avellaneda, R Ossorio, E Peris, S Shrestha. Analysis of Suitable Methodologies for Compressor Mass Flow Rate Correction to Other Superheat Levels and Refrigerants. 2024 XII Iberian Congress and X Ibero-American Congress of Refrigeration Sciences and Techniques.
- 60 S Mumme, B Kar, S Shrestha, Z Shen, D Howard, R Kishore, C Booten. Pushing the Envelope—Moving Dynamic Building Envelope Thermal Energy Storage Systems Mainstream. 2024 ACEEE Summer Study on Energy Efficiency in Buildings.
- 59 S Wanasinghe, S Shrestha, Z Demchuk, T Saito, C Gainaru, A Tamraparni, D Hun, T Feng, J Tiwari. Opacification of PIR Foams to enhance Thermal Resistivity. 2024 Polyurethanes Technical Conference.
- 58 A Tamraparni, J Rendall, Z Shen, D Hun, S Shrestha. Experimental Investigation and Performance Characterization of PCM Integrated Finned Tube Heat Exchanger for Building Heating and Cooling Applications. 2024 8th International High Performance Buildings Conference at Purdue.
- 57 J Marchante-Avellaneda, R Ossorio, E Navarro-Peris, S Shrestha. Influence of Suction Conditions and Refrigerant Fluid on Scroll Compressor Mass Flow Rate and Extrapolation Strategies. 2024 27th International Compressor Engineering Conference at Purdue.
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