

personal statement

Mark Fretz
mfretz@uoregon.edu

Dr. Mark Fretz is an Assistant Professor in the Department of Architecture at the University of Oregon and Interim Director of the Institute for Health in the Built Environment in the College of Design. He directs the Institute's industry research consortium, *Build Health*, which leverages design thinking and transdisciplinary science collaboration to develop and apply innovative design solutions for low-carbon buildings that simultaneously promote healthier individuals, communities and planet. Prior to practicing architecture, Mark was a Lieutenant Commander in the U.S. Public Health Service. As a designer, Mark has worked on projects ranging from product design to healthcare, single and multi-family housing, embassies, office buildings and district scale master planning. His research and teaching focus on exploring the unseen in the design of the built environment that affects human health across scales ranging from microbes and molecules to energy and carbon.

education

Mark Fretz
mfretz@uoregon.edu

2013 MASTER OF ARCHITECTURE
University of Oregon
Eugene, Oregon

2003 DOCTOR OF DENTAL SURGERY
University of Missouri-Kansas City
Kansas City, Missouri

1998 BACHELOR OF ARTS
Bethel College
North Newton, Kansas
Major: German, Minors: Chemistry, Mathematics
Magna Cum Laude

1996-1997 Phillips Universität Marburg
Marburg, Germany

2023 ASSISTANT PROFESSOR
University of Oregon, College of Design, Department of Architecture

2022 INTERIM DIRECTOR, INSTITUTE FOR HEALTH IN THE BUILT ENVIRONMENT
University of Oregon, College of Design

2017 ASSOCIATE DIRECTOR OF OUTREACH
University of Oregon, College of Design

2017 RESEARCH ASSISTANT PROFESSOR
University of Oregon, College of Design, Department of Architecture

2017 INSTITUTE FOR HEALTH IN THE BUILT ENVIRONMENT
University of Oregon

Founding leadership for the Institute in the College of Design at the University of Oregon composed of the Energy Studies in Buildings Lab, Biology and the Built Environment Center, Baker Lighting Lab, cross-disciplinary external research collaborators (biology, chemistry, medicine, engineering, physiology, toxicology) and industry partners (architects, engineers, manufacturers and non-profits) to address health at individual, community and planetary scale in the built environment.

2017 *BUILD HEALTH* INDUSTRY CONSORTIUM

Institute for Health in the Built Environment
Direct industry-funded research and disseminate findings through publications and presentations to industry and community stakeholders.

2014 ZGF ARCHITECTS

Associate

Engaged in all phases of design and construction from concept development through construction on residential, multi-use, healthcare, embassy and urban design.

2014 COURTESY RESEARCH ASSISTANT

University of Oregon, Energy Studies in Buildings Laboratory

2006 - 2010 UNITED STATES PUBLIC HEALTH SERVICE COMMISSIONED CORPS

Lieutenant Commander

2003 - 2006 UNITED STATES PUBLIC HEALTH SERVICE COMMISSIONED CORPS

Lieutenant

appointments

Mark Fretz
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research

Mark Fretz
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Awarded

2023 PI - DESIGN ASSISTANCE AND EVALUATION OF AN ALL-WOOD BUILDING, Wheeler County Soil and Water Conservation District, \$40,000

2023 PI - NEEA BETTER BRICKS 2023, Northwest Energy Efficiency Alliance, \$10,500

2023 PI - INFILTRATION OF ALL-WOOD FAÇADE CONSTRUCTION TECHNIQUES USDA ARS / Oregon State TallWood, \$120,000

2023 PI - MYCELIUM: DEVELOPING A BIO-COMPOSITE ACOUSTIC MAT ALTERNATIVE FOR MASS TIMBER ASSEMBLIES USDA ARS / Oregon State TallWood, \$35,000

2023 Co-PI (PI Erica Fischer) - STEEL-MASS TIMBER PANEL HYBRID DIAPHRAGMS USDA ARS / Oregon State TallWood, \$250,000

2023 - 2027 Co-PI (PI Gwynne Mhuireach) - INTEGRATING URBAN AGRICULTURE AND ARCHITECTURAL DESIGN THROUGH RESEARCH, EDUCATION, AND EXTENSION
USDA, \$1,000,000

2023 - 2025 Key Personnel - (PI Judith Sheine) TYPE I: REGIONAL ENGINE FOR SUSTAINABLE AND RESILIENT ARCHITECTURE, ENGINEERING, AND CONSTRUCTION IN MASS TIMBER (RE-ACT), National Science Foundation Engines, \$999,999

2022 - 2024 Co-PI (PI Anshuman Razdan) - MASS TIMBER PREFABRICATED PANELS FOR AFFORDABLE HOUSING PROTOTYPE DEVELOPMENT
US EDA BBB Regional Challenge / Business Oregon UIRF, \$2,500,000

2022 - 2026 Co-PI (PI Anshuman Razdan) - OREGON ACOUSTIC RESEARCH LABORATORY (OARL), US EDA BBB Regional Challenge / Business Oregon UIRF, \$18,750,000

2022 - 2024 PI - IMPROVING VENTILATION AND ENVIRONMENTAL DISINFECTION IN THE LONG-TERM CARE SETTING TO REDUCE EXPOSURES TO SARS-COV-2, STAGE II, DHS Oregon Health Authority, \$100,000

2022 PI - OREGON RESIDENTIAL ENERGY CODE COMPARISON TO FEDERAL MINIMUM REQUIREMENTS AND OREGON RESIDENTIAL ENERGY CODE 2005 BASELINE, Oregon Department of Energy, \$22,017

2022 - 2024 PI - FOREST TO FACADE: DEVELOPING SEISMIC + ENERGY MASS TIMBER COMMERCIAL FACADE RETROFITS, USDA ARS / OSU TallWood, \$160,000

2022 - 2024 Co-PI (PI Andre Barbosa, OSU) EVALUATING THE REUSE OF MASS TIMBER CONSTRUCTIONS, USDA ARS / OSU TallWood, \$60,000

2022 - 2023 PI - MILWAUKIE COURTYARD HOUSING PROJECT (MCHP)
USDA FS Wood Innovations / HomeWork Development, \$62,000

2022 - 2023 PI - EVALUATION OF AN ALL-WOOD BUILDING
USDA FS Wood Innovations / Waechter Architecture, \$30,000

2022 PI - HARDER MECHANICAL OFFICE ACOUSTIC TESTING WoodWorks/
Timberlab, \$8,600

2022 - 2026 PI - MEE CASA - MY ENERGY EFFICIENT HOME

research

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Portland Clean Energy Fund (PCEF) / Hacienda, \$75,000

2021 - 2022 PI - MILWAUKIE COURTYARD HOUSING PROJECT ENERGY ANALYSIS Energy Trust of Oregon / Homework Development, \$33,000

2021 Co-PI (PI Alison Kwok) - IMPACT OF SCHOOL FACILITIES ON STUDENT ENGAGEMENT AND LEARNING
California School Facilities Research Institute (CSFRI), \$50,000

2021 Co-PI (PI Van Den Wymelenberg) - NIKE SUSTAINABLE MATERIALS GUIDE Nike WD+C, \$50,000

2021 PI - MASS PLYWOOD PANEL (MPP) MISSING MIDDLE HOUSING RESEARCH AND DEVELOPMENT
USDA FS Wood Innovations / Shortstack Housing, \$39,947

2021 Key Personnel (PI Van Den Wymelenberg) - INTEGRATED HEALTH AND ENERGY LEVERS TO PROMOTE CLIMATE BENEFITS, COMMUNITY RESILIENCE AND PUBLIC HEALTH
Portland General Electric, \$32,009

2020 - 2022 PI - DEVELOPING AN APPLICATION FOR MASS PLYWOOD PANELS IN SEISMIC AND ENERGY WALL RETROFITS
USDA FS Wood Innovations, \$249,962

2020 - 2022 PI - OVERCOMING MARKET BARRIERS TO INCREASE USE OF STRUCTURAL MASS TIMBER IN HEALTHCARE ENVIRONMENTS
USDA FS Wood Innovations, \$249,942

2020 - 2023 PI - THE IMPACT OF SPECIES, COATINGS, AND RH ON MICROBIAL COMMUNITY STRUCTURE WITHIN MASS TIMBER PRODUCTS, USDA ARS / OSU TallWood, \$ 199,999

2020 - 2022 PI - CARBON NARRATIVES FOR DESIGN PLANNING
USDA ARS / OSU TallWood, \$184,327

2020 MICRO ACOUSTIC FLOOR/CEILING TEST CHAMBER, USDA ARS / OSU TallWood, \$30,000

2020 - 2022 Key Personnel (PI Van Den Wymelenberg / Jonathan Eisen, UC Davis) - MICROBIAL GENOMIC, TRANSCRIPTOMIC, AND SURVIVAL RESPONSE TO COMMON BUILT ENVIRONMENT LIGHTING
NSF, \$325,000

2020 Co-PI (PI Van Den Wymelenberg) - INDOOR ENVIRONMENTAL QUALITY STANDARDS UPDATE
Nike WD+C, \$48,729

2018 Key Personnel (PI Kevin Van Den Wymelenberg / Robert Martindale, OHSU) PREDICTING HEALTHCARE-ASSOCIATED CLOSTRIDIODES DIFFICILE INFECTION PROBABILITIES IN INPATIENT UNITS
OHSU/UO Seed Grant

2018 Key Personnel (PI Kevin Van Den Wymelenberg) VIEWS AND SHADES ANNOTATED BIBLIOGRAPHY: HEALTH, COMFORT, PRODUCTIVITY AND ORGANIZATIONAL COMMITMENT
Lutron Corporation, \$12.5k

2018 Key Personnel (PI Kevin Van Den Wymelenberg / Kaichang Li, OSU) - DEVELOPMENT OF ISOCYANATE-FREE AND FORMALDEHYDE-FREE ADHESIVES FOR CROSS-LAMINATED TIMBER (CLT)

USDA ARS / Oregon State TallWood

2018 Key Personnel (PI Van Den Wymelenberg) - ACOUSTIC LAB TESTING (ASTM E492- 2016, ASTM E90-2016) OF MULTI-FAMILY RESIDENTIAL CLT AND MPP WALL AND FLOOR ASSEMBLIES

Oregon Economic Development Authority, TallWood Design Institute

Submitted, Not Awarded

2023 Co-PI (PI Islam Hafez) - INVESTIGATION OF CARBON-SEQUESTERING COMPOSITES FOR EXTERIOR CLADDING PANELS USDA ARS / Oregon State TallWood, \$220,000

2022 Co-PI (PI Kevin Van Den Wymelenberg) - CLIMATE SMART FORESTRY USDA, \$3,314,157

2022 PI - UNIVERSITY OF OREGON 2.MO INDOOR PRACTICE FACILITY Softwood Lumber Board, \$389,736

2022 PI - PRESCOTT ELEMENTARY SOILS Portland Clean Energy Fund (PCEF), \$15,810

2022 PI - PRESCOTT ELEMENTARY AIR QUALITY Portland Clean Energy Fund (PCEF), \$39,984

2022 - 2025 Key Personnel (PI - Nancy Chang) HOUSING INEQUALITIES DURING THE COVID-19 LOCKDOWN National Science Foundation, \$200,000

2021 PI - DEVELOPMENT OF MASS PLYWOOD PANELIZED WORKFORCE SINGLE-FAMILY HOUSING. USDA FS Wood Innovations, \$234,063

2021 Key Personnel (PI - Amy Hermes, OHSU) - AEROSOLS AND CHILDBIRTH National Institutes of Health R01, \$1,049,998

2020 - 2023 Key Personnel (PI - Kevin Van Den Wymelenberg / Robert Martindale, OHSU) TRACKING CLOSTRIDIODES DIFFICILE IN HIGH-RISK PATIENT POPULATIONS AS THEY MOVE THROUGH A HOSPITAL; A STRAIN-LEVEL ASSESSMENT OF PATIENT INFECTIONS AND ROOM National Institutes of Health, \$1,500,000

2019 Key Personnel - LUMINAIRE LEVEL LIGHTING CONTROLS AND PREDICTIVE CONTROL OF HVAC Northwest Energy Efficiency Alliance, \$125,000

2019 Key Personnel - ENVELOPE RETROFITS USING MASS PLYWOOD PANELS IN AN AUTOMATED WORKFLOW U.S. Department of Energy Advanced Building Construction, \$1,000,000

2019 Key Personnel - CROSS-DISCIPLINARY RESEARCH ON THE INTERNET OF WILD THINGS (IOWT) TO DETECT, PROTECT FROM, PLAN FOR, AND STUDY WILDFIRES University of Oregon Resilience Initiative, \$50,000

2019 Key Personnel - INTEGRATED DOMESTIC DESIGN SOLUTIONS FOR SUSTAINABLE MOSQUITO CONTROL: GRANT WRITING WORKSHOP. An international, cross-disciplinary collaboration between the University of Oxford, London School of Hygiene and Tropical Medicine, King's College Global Health Institute, Ifakara Health Institute; University of North Carolina at Charlotte

research

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College of Arts + Architecture, Michael Singer Studio, UNHabitat, and University of Oregon Institute for Health in the Built Environment.
BOVA Network, \$22,000

2019 Key Personnel - QUANTIFYING THE NON-ENERGY BENEFITS OF END-TO-END DIGITIZATION OF THE MAINTENANCE WORKFLOW
Siemens, \$60,000

2019 Co-PI (Co-PI Lynne Strasfeld, OHSU) IMPACT OF INFECTION CONTROL MEASURES ON TRANSMISSION OF CARBAPENEM-RESISTANT/ FLUOROQUINOLONE-RESISTANT PSEUDOMONAS AERUGINOSA FROM WASTEWATER SITES IN A HEMATOLOGIC MALIGNANCY UNIT
OHSU/UO Seed Funding

2019 Key Personnel - OPTIMIZING MASS TIMBER DESIGN FOR REDUCED WASTE AND END-OF-LIFE REUSE.
Environmental Research and Education Foundation, \$86k

2019 Key Personnel - SMALL-SCALE CHAMBER INDOOR AIR QUALITY ASSESSMENT OF MASS TIMBER. Environmental Research and Education Foundation, \$250k

2019 Key Personnel - MICROBIOME + "CLEAN" IN THE MODERN WORLD. THREE PHASES OF INDUSTRY RESEARCH: LONG-TERM TESTING OF PROBIOTIC CLEANER, VISUALIZATION AND INTERPRETATION OF SCIENCE TO LAY AUDIENCE
Aunt Fannie's, \$38k

2018 Key Personnel - CREATING AFFORDABLE HOUSING THROUGH ENERGY EFFICIENCY AND HEALTHCARE EXPENDITURE OFFSETS
Meyer Memorial Trust; Meyer's 1 Million Months Challenge: Innovations in Affordable Housing Design, Finance and Construction, \$125k

2018 Key Personnel - LEVERAGING WEARABLE TECHNOLOGY TO INFORM BUILDING SIMULATION & MANAGEMENT FOR USE IN PREDICTIVE AND REACTIVE MODELING FOR OCCUPANT BEHAVIOR
University of Oregon I3 Grant, \$25k

2018 Key Personnel - DESIGN FOR ALL: THE DEVELOPMENT OF A UNIVERSAL DESIGN RESEARCH AND PRODUCT INNOVATION HUB
University of Oregon / Oregon Health and Science University Seed Grant, \$25k

2018 - present Director - *BUILD HEALTH* INDUSTRY CONSORTIUM
A collaboration between industry (architects, engineers, contractors, manufacturers, government agencies and non-profits) to fund higher risk, high impact pilot research. Funding companies have included: Nike, Microsoft, Velux, Swinerton, View, Inc., Condair, Siemens, Ecover/Method Soap People Against Dirty, Poppy, Perkins&Will, SRG Partnership, PAE Engineers, Scott Edwards Architects, ENNE Arquitectos, Hickock Cole, TRC, Ankrom Moisan Architects, EYP Architecture & Engineering, Enviral Tech, Mecho Systems, CO Architects, Dwyer, CoviCat, Path Sensors, Skanska, Ventacity, Rudy Munzell, Center of Design for an Aging Society, Z-Bioscience, Point Energy Innovations, Lacey Glass, SERA Architects. Total funding: \$573,000.

OCCUPANT-CENTRIC LIGHTING FOR NON-VISUAL CIRCADIAN RESOURCE
- Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, SRG Partnership. Role: co-PI, Lisa Petterson (SRG Partnership, co-PI), Siobhan Rockcastle (Baker Lighting Lab, co-PI) Graduate student

research

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consortium research

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researchers: Jordan Pieper, Nico Pici, Megan Dannell. Fall 2019

LCA OF MASS TIMBER VERSUS STEEL CONSTRUCTION, INCLUDING MASS TIMBER SOURCED FROM EUROPEAN VERSUS NORTH AMERICAN MANUFACTURERS - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Hacker Architects. Role: co-PI, Scott Barton-Smith (Hacker Architects, co-PI), Student researchers: Simone O'Halloran, Yasmin Kazeminejad. Fall 2019

CO₂, COGNITION AND OFFICE DESIGN - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Gensler Architects. Role: co-PI, Amanda Ingmire (Gensler Architects, co-PI), Graduate student researchers: Jasmeen Ezat Agha, Cary Chu. Fall 2019

ELECTRIC LIGHTING AND THE INDOOR MICROBIOME - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Scott Edwards Architecture. Role: co-PI, Melissa Kuhn (Scott Edwards Architecture, co-PI), Graduate student researchers: Lindsey Naganuma, Isaac Wimer. Fall 2019

PASSIVE VENTILATION AND INDOOR AIR REMEDIATION OF OUTDOOR AIR POLLUTION - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Opsi Architects. Role: co-PI, Heather Degrella (Opsi Architects, co-PI), Graduate student researchers: Elise Braun, Thomas Cooper, Marsie Surguine. Fall 2019

MASS TIMBER, INDOOR ACOUSTICS AND HEALTH - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, FFA Architects and Mackenzie Architects. Role: co-PI, Juliette Grummon-Beale (FFA Architects, co-PI), Alison Hoagland (Mackenzie Architects, co-PI), Graduate student researchers: Olivia Bain, Michelle Montiel, Lily Summers, Michael Yauk. Fall 2019

LOW-COST, LOW-EMBODIED CARBON ACOUSTICAL DESIGN FOR MASS TIMBER FLOOR ASSEMBLIES - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Lever Architects, Path Architecture. Role: co-PI, Jonathan Heppner (Lever Architects, co-PI), Emily Dawson (Path Architects, co-PI), Graduate student researchers: Madeline Chu, Breanna Geiser, Kory Kerber. Fall 2019

DAYLIGHTING, CIRCADIAN STIMULUS AND VIEW IN AFFORDABLE HOUSING - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, SERA Architects. Role: co-PI, Gauri Rajbaidya (SERA Architects, co-PI), Graduate student researchers: Katherine Martin, Bentley Rager. Fall 2019

HEALTH IMPACTS OF BUILDINGS ON URBAN WATERSHEDS - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture, Role: co-PI, Graduate student researcher: Catherine Earley. Fall 2019

SPATIAL EFFECTS OF DAYLIGHT, BUILDING ORIENTATION AND WINDOW SHADE USE ON THE INDOOR MICROBIOME OF A HEMATOLOGIC MALIGNANCY UNIT. - Current funding: IHBE Build Health consortium. Role: co-PI, Sue Ishaq, PhD (co-PI), Kevin Van Den Wymelenberg, PhD (PI). 2019-present

"HYPHY" HYPER PHYTO REMEDIATION OF INDOOR AIR AND INDOOR BIOPHILIA THROUGH THE USE OF PLANT WALLS - Current funding: IHBE Build Health consortium. Role: co-PI, Kevin Van Den Wymelenberg, PhD (PI), Hooman Parhizkar (co-PI). 2019-present

RADIANT HEATING + HEALTH - Funding: IHBE Build Health consortium, University of Oregon Department of Architecture. Role: PI. Graduate student

consortium research

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researchers: Catherine Earley, Rachael Lozeau, Chelsea Clark, Angelo DeBlase.
Fall 2018

INDOOR AIR QUALITY IN MECHANICALLY VERSUS PASSIVELY VENTILATED
KITCHENS - Funding: IHBE Build Health consortium, University of Oregon
Department of Architecture. Role: PI. Graduate student researchers: Gloria
Morazan, Fatemeh Eskandari, Kean Tom. Fall 2018

VIRTUAL REALITY RESEARCH METHODS FOR ASSESSING THERMAL
COMFORT - Funding: IHBE Build Health consortium, University of Oregon
Department of Architecture. Role: PI, Graduate student researchers: Zachariah
Petett, Josh Rosenthal, Camila Salazar. Fall 2018

LIGHT AND HEALTHY AGING - Funding: IHBE Build Health consortium,
University of Oregon Department of Architecture. Role: key personnel. Kevin Van
Den Wymelenberg, PhD (PI), Jeff Kline (co-PI), Graduate student researchers:
Sandy Byers, Emma Schumacher, Drew Olguin, Estefania Valdivia Solorzano.
2019-present

CLEANING, INDOOR CHEMISTRY AND THE MICROBIOME - Funding: IHBE Build
Health consortium. Role: key personnel. Sue Ishaq, PhD (PI) 2018

COMPARING PM 2.5 AND PM 10 LEVELS IN RECIRCULATING AND DUCTED
PASSIVHAUS STOVE HOODS - Funding: IHBE Build Health consortium,
University of Oregon Department of Architecture, Green Hammer Construction.
Role: co-PI. Alex Boetzel (co-PI), Graduate student researchers: Colton Groves,
Aiden Pera. Spring 2018

A COMPARISON OF THE EMBODIED ENERGY OF MASS TIMBER, CONCRETE
AND STEEL STRUCTURAL SYSTEMS - Funding: IHBE Build Health consortium,
University of Oregon Department of Architecture, Hacker Architects. Role: co-PI,
Alex Zelaya (Hacker Architects, co-PI), Graduate student researchers: Travis
Walsh, Jonah Jumila, Gretchen Leary. 2018

THE INDOOR THERMAL ENVIRONMENT OF DWELLING UNITS EQUIPPED
WITH PACKAGED TERMINAL AIR CONDITIONERS - Funding: IHBE Build Health
consortium, University of Oregon Department of Architecture, Ankrom Moisan
Architects. Role: co-PI, Amanda Ingmire (Ankrom Moisan Architects, co-PI),
Graduate student researchers: Ellen Kume, Skyla Leavitt, Kevin Neuman. Spring
2018

LIGHT AND AIR: A CASE STUDY IN THE RELATIONSHIP BETWEEN
DAYLIGHTING AND INDOOR AIR QUALITY - Funding: IHBE Build Health
consortium, University of Oregon Department of Architecture, Scott Edwards |
Architects. Role: co-PI, Melisse Kuhn (Scott Edwards | Architects, co-PI), Graduate
student researchers: Nate Carden, Lane Madich, Roberto Palau. Spring 2018

DAYLIGHT, A MILLION BACTERIA, AND THE OFFICE MICROBIOME - Funding:
IHBE Build Health consortium, University of Oregon Department of Architecture,
Zimmer Gunsul Frasca Architects. Role: co-PI, Kurt Chiusolo (Zimmer Gunsul
Frasca Architects, co-PI), Graduate student researchers: Gloria Morazan, Ethan
Zagorec-Marks, Bill Sandstrom. Spring 2018

PASSIVE HOUSE AND HEALTH: COMPARING HUMIDITY LEVELS IN A VAPOR
DIFFUSION VENTILATED AND AIR VENTILATED ATTIC - Funding: IHBE Build
Health consortium, University of Oregon Department of Architecture, Green
Hammer. Role: co-PI, Alex Boetzel (Green Hammer, co-PI), Graduate student
researchers: Andre Zerba, Michael Moran. Spring 2018

ABILITY OF CLT TO MITIGATE SOUND TRANSMISSION - Funding: IHBE Build

Health consortium, University of Oregon Department of Architecture, SRG Architects. Role: co-PI, Lisa Petterson (SRG Architects, co-PI), Graduate student researchers: Connor Stephens, Takanori Mizutani, Jorge Cabrera. Spring 2018

WOOD AND VISUAL THERMAL PERCEPTION - Funding: USDA Agricultural Research Service, TallWood Design Institute. Role: key personnel, Kevin Van Den Wymelenberg, PhD (PI), Denise Blankenberger (MS Thesis). 2017-2018

Peer-reviewed Journal Articles

Parhizkar, H., **Fretz, M.**, Laguerre, A., Stenson, J., Corsi, R., Van Den Wymelenberg, K., and Gall, E. (2022). A novel VOC breath tracer method to evaluate indoor respiratory exposures in the near- and far-fields. *Journal of Exposure Science and Environmental Epidemiology*. <https://doi.org/10.1038/s41370-022-00499-6>

Horve, P.F., Dietz, L., **Fretz, M.**, Constant, D.A., Wilkes, A., Townes, J.M., Martindale, R.G., Messer, W.B., and Van Den Wymelenberg, K. (2021). Identification of SARS-CoV-2 RNA in Healthcare Heating, Ventilation, and Air Conditioning Units. *Indoor Air*. <https://doi.org/10.1111/ina.12898>.

Hermesch, A.C., Horve, P.F., Edelman, A., Dietz, L., Constant, D., **Fretz, M.**, Messer, W.B., Martindale, R., and Van Den Wymelenberg, K. (2020). Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Environmental Contamination and Childbirth. *Obstetrics & Gynecology* doi: 10.1097/AOG.0000000000004112

Horve, P.F., Dietz, L.G., Ishaq, S.L., Kline, J., **Fretz, M.**, and Van Den Wymelenberg, K.G. 2020. Viable bacterial communities on hospital window components in patient rooms. *PeerJ* 8:e9580 <https://doi.org/10.7717/peerj.9580>

Dietz, L., Horve, P.F., Coil, D.A., **Fretz, M.**, Eisen, J.A., Van Den Wymelenberg, K. (2020). 2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission. *mSystems*, 5 (2) e00245-20; doi: 10.1128/mSystems.00245-20

Velazquez, S., Griffiths, W., Dietz, L., Horve, P., Nunez, S., Hu, J., Shen, J., **Fretz, M.**, Bi, C., Xu, Y., Van Den Wymelenberg, K., Hartmann, E.M., and Ishaq, S.L. (2019). From one species to another: A review on the interaction of chemistry and microbiology in relation to cleaning in the built environment. *Indoor Air*. <https://doi.org/10.1111/ina.12596>

Horve, P.F., Lloyd, S., Mhuireach, G.A., Dietz, L., **Fretz, M.**, MacCrone, G., Van Den Wymelenberg, K., and Ishaq, S.L. (2019). Building upon current knowledge and techniques of indoor microbiology to construct the next era of theory into microorganisms, health, and the built environment. *Journal of Exposure Science & Environmental Epidemiology*, <https://doi.org/10.1038/s41370-019-0157-y>

Fahimipour, A.K., Hartmann, E.M., Siemens, A., Kline, J., Levin, D.A., Wilson, H., Betancourt-Roman, C.M., Brown, G.Z., **Fretz, M.**, Northcutt, D., Siemens, K.N., Huttenhower, C., Green, J.L., and Van Den Wymelenberg, K.G. (2018). Daylight exposure modulates bacterial communities associated with household dust. *Microbiome*, 6(1), 175.

Juried | In Review or Preprint

Dietz, L., Constant, D.A., **Fretz, M.**, Horve, P.F., Olsen-Martinez, A., Stenson, J.,

publications

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publications

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Wilkes, A., Martindale, R.G., Messer, W.B., and Van Den Wymelenberg, K. (2021). Exploring Integrated Environmental Viral Surveillance of Indoor Environments: A comparison of surface and bioaerosol environmental sampling in hospital rooms with COVID-19 patients. medRxiv doi: <https://doi.org/10.1101/2021.03.26.21254416> (preprint).

Stenson, J., **Fretz, M.**, Northcutt, D., Cooley, T., and Van Den Wymelenberg, K. Acoustic performance of novel cross-laminated timber and mass plywood panel floor and wall assemblies. Estimated submission November 2019 to the Journal of the Acoustical Society of America Express Letters

Juried Conference

Sheine, J., **Fretz, M.**, O'Halloran, S., Gershfeld, M. (2023). "Mass Timber Panelized Workforce Housing in Oregon, U.S." Proceedings of the 2023 World Conference on Timber Engineering (WCTE), June 19-22, 2023, Oslo, Norway (submitted).

Fretz, M., Stenson, J., Orozco Orozco, G.F., Narancic, P., Casey, F., Northcutt, D., Van Den Wymelenberg, K., Sheine, J., Barbosa, A. (2023). "Developing an Application for Mass Plywood Panels in Seismic and Energy Wall Retrofits." Proceedings of the 2023 World Conference on Timber Engineering (WCTE), June 19-22, 2023, Oslo, Norway (submitted).

Orozco Orozco, G.F., Barbosa, A., **Fretz, M.**, Sheine, J., Stenson, J., Van Den Wymelenberg, K., Narancic, P., Casey, F. (2023). "Seismic and Energy Retrofit of Multifamily Light-Frame Timber Residential Buildings Using Mass Ply Panel (MPP) Wall Facade System." Proceedings of the 2023 World Conference on Timber Engineering (WCTE), June 19-22, 2023, Oslo, Norway (submitted).

Kwok, A., **Fretz, M.**, Van Den Wymelenberg, K., Seely, J., Coronado, M.C., and Lee, J. (2022). Engaging school facilities: A literature review, 2022 PLEA, pp. 592-597, November 22-25, 2022, Santiago, Chile.

Parhizkar, H., Rockcastle, S., **Fretz, M.**, and Van Den Wymelenberg, K.G. (2022). A Simulation-Based Approach To Mitigate Disease Transmission Risk From Aerosol Particles In Buildings, 2022 Annual Modeling and Simulation Conference (ANNSIM), pp. 742-752, doi:10.23919/ANNSIM55834.2022.9859484.

Sokolowski, S.L., Clausen, A., and **Fretz, M.** (2021). "Modernizing the Walking Cane to Integrate Ergonomics and Wayfinding Technology to Improve Aesthetics and Functionality for <55-Year-old Users." Advances in Human Factors and Ergonomics - Proceedings of the AHFE 2021 International Conference on Human Factors and Ergonomics, July 25-29, 2021, New York, USA.

Sokolowski, S.L., Ende, E., and **Fretz, M.** (2021). "Manual Wheelchair Design to Improve User Safety, Comfort and Aesthetics for the Aging Population." Advances in Human Factors and Ergonomics - Proceedings of the AHFE 2021 International Conference on Human Factors and Ergonomics, July 25-29, 2021, New York, USA

Sokolowski, S.L., Calabrese, D., and **Fretz, M.** (2021). "Development of a Mobile Planter Structure to Enable Ease of Use and Enjoyment for the Aging Gardener." Advances in Human Factors and Ergonomics - Proceedings of the AHFE 2021 International Conference on Human Factors and Ergonomics, July 25-29, 2021, New York, USA

Ward, P., Castro, I., Fiorelli, T., **Fretz, M.**, Ko, Y., Lee, J., Russel, K., da Silva Correa Leite, C. & Van Den Wymelenberg, K. (2020). Open Home Project: Designing Modular Housing and Landscapes for Resilient Communities. *ACEEE Summer Study on Energy Efficiency in Buildings*.

publications

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Non-Juried

Institute for Health in the Built Environment Annual Research Report. Prepared for Build Health Industry Consortium. 2022

Institute for Health in the Built Environment Research Report #2. Prepared for Build Health Industry Consortium. 2021

“Spatial wellness in the modern workplace,” Prepared for Build Health Industry Consortium. 2020

Institute for Health in the Built Environment Research Report #1. Prepared for Build Health Industry Consortium. 2020

Institute for Health in the Built Environment Post-Conference Report. Prepared for Build Health Industry Consortium. 2020

Institute for Health in the Built Environment Quarter One Research Report. Prepared for Build Health Industry Consortium. 2019

Institute for Health in the Built Environment Post-Conference Report. Prepared for Build Health Industry Consortium. 2019

Ward, P., Earley, C., **Fretz, M.**, Rockcastle, S., McHill, A., Butler, M., and Van Den Wymelenberg, K. (2019). Impact of modern indoor lighting on the human circadian system. (2019). Self-published whitepaper. Prepared for Lutron Electronics, Inc.

Institute for Health in the Built Environment Quarter Three Research Report. Prepared for Build Health Industry Consortium. 2019

Institute for Health in the Built Environment Quarter Two Research Report. Prepared for Build Health Industry Consortium. 2018

Institute for Health in the Built Environment Quarter One Research Report. Prepared for Build Health Industry Consortium. 2018

Institute for Health in the Built Environment Post-Conference Report. Prepared for Build Health Industry Consortium. 2018

Wymelenberg, K., Duffy, K., Hatten, M., Kellett, R., Mhuireach, G., Augenbaugh, D., Brune, M., Chatto, C., Cheng, N., Clark, E., Cole, J., Collins, N., **Fretz, M.**, Green, J., Grondzik, W., Hagenlocher, E., Haglund, B., Jennings, J., Krevlin, J., Kendall, H., Kwok, A., Lazarus, M., Meek, C., Muller, B., Nute, K., Petterson, L., Pyatok, M., Reynolds, J., Rowell, J., Smith, J., Schleuning, J., Tepfer, F., Thomson, G., Ubbelholde, S., Wasley, J., Wiener, J., Yousey, J., Yrazabal, J. (2017). Transforming architecture: A Festschrift in honor of Professor G.Z. “Charlie” Brown. Eugene, OR: University of Oregon.

Technical Reports

“A Prototype for Affordable, Resilient, Low-Energy Cottage Cluster Housing.” Co-produced with HomeWork Development, Sister City Development, Wild Hair Development, PAE, TallWood, Energy Design and Elemental Energy. Submitted to Energy Trust of Oregon. 2023.

“Milwaukie Courtyard Housing Project (MCHP) Energy Analysis.” PI and lead author for report submitted to HomeWork Development / Energy Trust of Oregon. 2022

“Impact of School Facilities on Student Learning and Engagement” Co-PI for white paper submitted to California School Facilities Research Institute. 2021

“Reopening America: Strategies for Safer Buildings.” Contributor for report issued by the American Institute of Architects. May 28, 2020.

“OHSU Sink Splash Zone Investigation and Behavioral Monitoring on 14K Oncology Unit.” Prepared for Oregon Health & Science Infection Prevention and Control. July, 2019

“Acoustic Lab Testing (ASTM E492-2016, ASTM E90-2016) of CLT and Wall and Floor Assemblies for Multi-Family Residential Application.” Prepared for TallWood Design Institute. March, 2019

“Demo House Stressed Structural Skin Report.” Prepared for Paul Weir, Springfield. 2013

“Concrete Overhang and Parapet Insulation Options for an Embassy in Ashgabat.” Prepared for Yost Grube Hall Architects. 2013

Invited Presentations and Exhibitions

2023 WORLD CONFERENCE ON TIMBER ENGINEERING (WCTE 2023) Oral Presentation, “Developing an Application for Mass Plywood Panels in Seismic and Energy Wall Retrofits.” Oslo, Norway, June, 2023

2023 THE PHYSIOLOGY OF OBESITY CLASS, Guest lecture, Topic: The Built Environment’s Role in Health, Prof. Carrie McCurdy, Department of Physiology, University of Oregon, May 31, 2023.

2023 VENICE BIENNALE, TRANSPECIES DESIGN SYMPOSIUM, Keynote Presentation, “Microbial Tectonics.” Palazzo Michiel, Venice, Italy, May 19, 2023.

2023 VENICE BIENNALE, TRANSPECIES DESIGN EXHIBITION, Organized Biology and the Built Environment Center’s contribution to the “Transpecies Design Exhibition,” which was part of the *Time, Space, Existence* Exhibition hosted by the European Cultural Centre at Palazzo Bembo, Venice, Italy, May 20 - November 26, 2023.

2023 WAECHTER ARCHITECTS, Invited speaker for Timber Talk event, “Panelized facade retrofits and panelized affordable housing.” March 9, 2023.

2023 OREGON BOARD OF FORESTRY, Invited to present “Panelized MPP facade retrofits and panelized affordable housing.” March 9, 2023. Oregon State University, Corvallis, Oregon.

2023 ENERGY TRUST OF OREGON, Invited speaker with Net Zero Fellow, Jessy Ledesma, to present “A Prototype for Affordable, Resilient, Low-Energy Cottage Cluster Housing.” March 8, 2023. Webinar.

2023 NORTHWEST ENERGY EFFICIENCY ALLIANCE PRODUCT COUNCIL, Invited to present “Forest to Facade,” January 31, 2023. Webinar.

2022 AIA OREGON, Invited to present the Energy Award at the 2022 Architecture Awards. November 18, 2022.

2022 TALLWOOD DESIGN INSTITUTE RESEARCH SYMPOSIUM, Invited to present on “Forest to Facade,” and “Carbon Narratives for Design Planning” projects. October 13, 2022

2022 LSW ARCHITECTS, Invited to present “Design the Unseen: Biophilia,” July 27, 2022

2022 SUSTAINABLE BUILDING MONTHLY, Invited to present on “Forest to

presentations

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Facade: Seismic + Energy Multifamily Retrofits” Project, May 2022.

2022 MASS TIMBER CONFERENCE TECHNICAL ACADEMY, Invited to present, “Forest to Facade: Seismic + Energy Multifamily Retrofits” April 2022.

2022 LA UNIVERSIDAD DE LAS AMERICAS (UDLA) - Invited speaker on “Design the Unseen: Biophilia,” Quito, Ecuador, April 7, 2022

2022 AXXIS HOSPITAL - Invited speaker together with Jason Stenson on IHBE research and design for safer healthcare environments. Quito, Ecuador, April 8, 2022

2021 SUSTAINABLE BUILDING WEEK, Invited to present research updates from IHBE.

2021 TULANE SCHOOL OF ARCHITECTURE, Virtual presentation, Topic: Design the Unseen. April 7, 2021.

2021 OREGON SOUTHERN WASHINGTON ASSOCIATION FOR PROFESSIONALS IN INFECTION CONTROL & EPIDEMIOLOGY (OSWAPIC), Virtual presentation, Topic: SARS-CoV-2 research in healthcare settings conducted by BioBE. February 11, 2021

2021 BUILDING HEALTH SEMINAR, Guest lecture, Prof. Van Den Wymelenberg. Topic: Thermal Health in the BE, January 26, 2021

2020 AIA/ACSA INTERSECTIONS CONFERENCE, Invited panel speaker, “Carbon + Health”

presentations

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2020 HEALTH IN BUILDINGS ROUNDTABLE (HiBR) SCHOLAR PRESENTATION SERIES, Virtual presentation as HiBR Scholar, “Design for Healthy Aging,” National Institutes of Health, December 9, 2020.

2020 GREEN BUILDING SLAM, Invited presenter, Topic: “Mass Plywood Panel grid-enhancing affordable cluster housing pilot: a proposed solution for the health of individuals, communities and planet.” Bellingham, Washington, December 3, 2020. (virtual)

2020 TALLWOOD DESIGN INSTITUTE LECTURE SERIES, Invited speaker

2020 “VOICES OF INNOVATION” LECTURE SERIES, Invited to co-present with Prof. Kevin Van Den Wymelenberg for the first installment of the at the University of Oregon. Topic: “Pandemics and the built environment: How cities and buildings will change after Covid-19.” May 28, 2020 (virtual).

2020 “COVID-19 AND THE FUTURE OF CITIES.” Invited to present on IHBE/ BioBE research to Scott Edwards Architecture Office. Portland, Oregon, May, 28, 2020 (virtual).

2020 VI INTERNATIONAL MEETING ON INFECTIOUS AND CHRONIC DISEASE RESEARCH AND TROPICAL MEDICINE, Invited to present on built environment microbiome research. Pontifica Universidad Catolica del Ecuador. Quito, Ecuador, Jun 16-18, 2020. (Canceled due to COVID-19)

2020 ENTOMOLOGICAL HAPPENINGS, Invited to present on IHBE research. Dar es Salaam, Tanzania, Jun 1-6, 2020 (Canceled due to COVID-19)

2020 MILLER HULL PARTNERSHIP, LUNCH AND LEARN
Invited to present AIA talk titled: “Design the Unseen: Indoor Microbiomes, Architecture and Evolution.” Seattle, Washington. Mar 24, 2020 (Canceled due to COVID-19)

presentations

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2020 ZERO ENERGY READY OREGON (ZERO) COALITION
Invited to present ESBL research. Portland, Oregon, Feb, 5, 2020

2020 ARCS FOUNDATION, OREGON CHAPTER, Invited to present on indoor microbiome research. Talk titled: Design the Unseen: Indoor Microbiomes, Architecture and Evolution. Portland, Oregon, Jan 8, 2020

2020 AMERICAN STATISTICAL ASSOCIATION, PORTLAND CHAPTER
Invited to present on indoor microbiome research. Portland, Oregon, Jan 8, 2020

2020 PAE ENGINEERS, LUNCH AND LEARN
Invited to present on indoor microbiome research. Portland, Oregon, Dec 12, 2020

2020 OREGON CHAPTER OF AMERICAN PLANNING ASSOCIATION ANNUAL MEETING, Invited to present on cluster housing panel, Eugene, Oregon, Oct 24, 2020.

2020 ARCS OREGON LEADERSHIP - ARCS FOUNDATION, Invited to present BioBE research (60-min) to leadership team, Portland, Oregon, Jun 14, 2019.

2018 PIONEERING A NEW FRONTIER - IHBE Build Health 2018. Portland, Oregon, May 17, 2018

2019 IIDA MATERIAL TRANSPARENCY PECHA KUCHA, Invited to present on Indoor Microbiome - IIDA, Portland, Oregon, Jun 20, 2019.

2019 NSF WORKSHOP ON ARCHITECTURAL FACULTY IN ENVIRONMENTAL SUSTAINABILITY RESEARCH, Invited to present IHBE Research PechaKucha - Toronto, Canada, May 28, 2019.

2019 ACOUSTIC LAB TESTING MULTI-FAMILY RESIDENTIAL CLT AND MPP WALL AND FLOOR ASSEMBLIES, Oral presentation, IHBE Build Health 2019, Portland, Oregon, May 16, 2019

2019 HEALTHY MATERIALS IN AFFORDABLE HOUSING - HEALTH PRODUCT DECLARATION COLLABORATIVE / PORTLAND MATERIALS TRANSPARENCY COLLABORATIVE, Invited moderator of 1.5 hour panel of experts on healthy materials in affordable housing, Portland, Oregon, May 6, 2019.

2019 DESIGN WEEK PORTLAND - Design Week Portland, 60-min community presentation, Portland, Oregon, Apr 10, 2019.

2019 PIVOT ARCHITECTURE, 60-min all Office Presentation on IHBE research, Eugene, Oregon, April 1, 2019.

2019 LEASE CRUTCHER LEWIS 60-min presentation on IHBE work CEO, Bart Ricketts, March 7, 2019.

2019 SCIENCE AND ARCHITECTURE UOAA (UO ALUMNI ASSOCIATION), 60-min Alumni Association Science Pub Talk on the topic of "Designing the Unseen" and 30-min lab tour of 50-60 guests, Portland, Oregon, March 7, 2019

2019 BORA ARCHITECTS, 60-min all Office Presentation on IHBE Research Introduction.

2019 MECHOSYSTEMS, 60-min webinar to sustainability leadership team on IHBE Research Introduction.

2019 PERKINS+WILL, 60-min webinar together with Kevin Van Den Wymelenburg, Siobhan Rockcastle, to SF, NYC and Seattle office lab leaders on IHBE Research Introduction.

2019 ARUP, 60-min webinar together with Kevin Van Den Wymelenburg on IHBE Research Introduction to SF office.

2019 ROSE VILLA SENIOR LIVING Presentation to CEO and staff, together with Sue Ishaq and Jeff Kline on IHBE Research.

2019 IHBE Q2 CONSORTIUM WEBINAR, Research presentation

2019 IHBE Q1 Consortium Webinar, Research presentation

2019 PAE ENGINEERS, 60-min Personal Meeting with research update, Portland, Oregon.

2019 ZGF ARCHITECTS, 60-min Multi-office lunch and learn presentation on IHBE Research Introduction.

2019 HOLST ARCHITECTS, 60-min all Office Presentation on IHBE Research Introduction, Portland, Oregon, Jan 4, 2019.

2018 ZIDELL REALITY, 60-min presentation to leadership team on IHBE Research Introduction, Portland, Oregon, Nov 16, 2018.

2018 IFMA, 60-min presentation to IFMA South Valley June Event on "Real-time Continuous Commissioning Case Studies," together with Paul Ward, Eugene, Oregon, June 21, 2018.

2018 SLOAN DESIGN CHAMPS, 60-min Webinar together with Ashkaan Fahimipour, Sue Ishaq and Jeff Kline on topic: Daylight + Microbiome.

presentations

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2018 ANKROM MOISAN ARCHITECTS, Design the Unseen Research findings, Portland, Oregon.

2018 HACKER ARCHITECTS, Design the Unseen Research findings, Portland, Oregon.

2018 SRG Architects, Design the Unseen Research findings, Portland, Oregon.

2018 GREEN HAMMER, Design the Unseen Research findings, Portland, Oregon.

2018 PROTECTIVE ATMOSPHERES WORKSHOP, Invited presenter, "Beyond - Protective Atmospheres," Portland, Oregon, Oct 25, 2018.

2018 NW ECOGUILD GREEN BUILDING SLAM, Invited Presenter "Beyond," Portland, Oregon, Oct 12, 2018

2018 SUSTAINABLE BUILDING WEEK, "Considering the micro and macro in educating designers," Portland, Oregon, Oct 10, 2018.

2018 FFA ARCHITECTS, 60-min all-office presentation on IHBE Research Introduction.

2018 SCOTT EDWARDS| ARCHITECTS, 60-min all-office presentation on IHBE Research Introduction, Portland, Oregon.

2018 GENSLER ARCHITECTS, 60-min all-office presentation on IHBE Research Introduction, Portland, Oregon.

2018 MAHLUM ARCHITECTS, 60-min all-office presentation on IHBE Research Introduction, Portland, Oregon, Sept 17, 2018.

2018 TALLWOOD CODE OFFICIALS RESEARCH FORUM, Invited presenter, Mass Timber Acoustic Research - OSU, Corvallis, Oregon.

2018 TALLWOOD MASS TIMBER ACOUSTICS MEETUP, Invited presenter, Mass Timber Acoustic Research - OSU, Portland, Oregon, Sept 20, 2018.

2018 AIA MATERIALS MATTER SERIES, Invited presenter, Healthy Planet: Materials + the Environment - Portland, Session 1, 60-min. Portland, Oregon, Sept 20, 2018

Poster Presentations

2023 INCORPORATING REUSED MATERIALS CAN REDUCE THE CARBON FOOTPRINT OF MASS TIMBER DESIGNS. Kontra, S., Barbosa, A., Sinha, A., Sheine, J., **Fretz, M.**, Simpson, B., van de Lindt, J., and Brown, N. Presented at the 2023 International Mass Timber Conference, Portland, Oregon, March 27-29, 2023.

2020 UNIVERSAL DESIGN FOR HEALTHY AGING: MEMORY, MOBILITY AND METRICS. Role: lead author. Contributors: Susan Sokolowski, PhD, Department of Product Design, Esther Hagenlocher, Departments of Architecture and Interior Architecture, University of Oregon. Submitted to: National Institutes of Health 2020 Health in Buildings Roundtable (HiBR) Conference.

Professional Outreach

2021 CARBON NARRATIVES FOR DESIGN PLANNING, Co-organized (Co-PI's Alison Kwok and Kevin Van Den Wymelenberg) and moderated workshop series for Carbon Narratives for Design Planning: "Wood Certifications," April 30, 2021; "Beyond the EPD," May 28, 2021; "Comparing Carbon Narratives," August 12, 2021; "LCA Assumptions," July 30, 2021 and "Building End of Life," September 24, 2021.

2018 SUSTAINABLE BUILDING WEEK, Co-organized first annual Sustainable Building Week, Portland, Oregon

2018 AIA MATERIAL MATTER LECTURE SERIES, Portland, Co-presented at first annual event

2018 PORTLAND INNOVATION QUADRANT, Represented University of Oregon Portland, sustainability workshop

DESIGN WEEK PORTLAND, Developed, organized and presented Design the Unseen program for IHBE

Hosted and presented at Mass Timber Meetup on acoustics

Frequent presenter at area AEC firms on University research

Industry Outreach

2022 BUILD HEALTH RESEARCH SYMPOSIUM
"Transpecies Design: Beyond the Built." June, 16-17.
Organized and hosted virtual industry research symposium.

2021 BUILD HEALTH RESEARCH SYMPOSIUM
"Build Health." May, 20-21.
Organized and hosted virtual industry research symposium.

2020 BUILD HEALTH RESEARCH SYMPOSIUM
"Building Health: Environmental. Designed. Determinants." May, 14-15.
Organized and hosted virtual industry research symposium.

outreach

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teaching

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2019 MASS TIMBER RESEARCH SYMPOSIUM

Invited presenter to industry, government officials and academia on mass timber research, "Design and Human Factors." October 2019

2019 BUILD HEALTH RESEARCH SYMPOSIUM

Organize annual event that brings together a cross-disciplinary group of academe and industry to innovate in the built environment.

2018 BUILD HEALTH RESEARCH SYMPOSIUM

Organize annual event that brings together a cross-disciplinary group of academe and industry to innovate in the built environment.

2018, 2019, 2021 DESIGN THE UNSEEN

Developed new graduate level research seminar, which integrated College of Design students into Portland architecture firms to research topics of health and energy in built projects.

2021 HOSPITAL AEROSOL INFECTION OUTBREAK

Independent study with MArch McKenzie Vanko using physical water model to simulate corridor airflow and infection spread for COVID cluster outbreak at OHSU.

2020 UNIVERSAL DESIGN FOR HEALTHY AGING: MEMORY, MOBILITY AND METRICS

Co-developed with Susan Sokolowski - Sports Product Design, Esther Hagenlocher - Arch, Interior Architecture, a new graduate level class that is cross-disciplinary across College of Design in Eugene/Portland campuses and integrates product design, art, architecture and metrics to design for healthier aging.

2019 THE LIVING BUILDING

Taught graduate level seminar, which integrates IHBE research findings into environmental control of buildings.

2019 BUILDING THE VECTOR OUT

Independent study with M.S. student Catherine Earley investigating the role of design thinking and multi-disciplinary charrettes in designing for the prevention of malaria in the built environment.

2019 MASS TIMBER LAMINATION METHODS

Independent study with student Yasmin Kazeminejad investigating the ways in which mass timber producers in North America and Europe are laminating wood. Yasmin is also investigating industry preferences by architects and any finishes that they also choose to apply.

2019 SUSTAINABLE MATERIALS MANAGEMENT

Grant writing independent study with student Olivia Bain to develop a proposal on mass timber sustainable material management at end-of-life. Proposal submitted to Environmental Research and Education Foundation (EREF).

2019 PASSIVE HOUSE

Independent study with MArch student Olivia Bain on Passive House design and construction.

2018 HEALTHY BUILDINGS

Independent study with MArch student Gloria Morazan investigating health performance indicators (HPI's) to quantitatively evaluate the holistic health of a building.

student activity

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Students Advised

2023 - present ANUPAM SATUMANE

Member of PhD committee. Dissertation topic: "Impacts of Environmental, Contextual, and Window Shading Factors on Occupant Experience and Performance."

2023 - present JENNY WILDER

Chair of MS committee. Thesis topic: "Linseed Oil Paints' Use in Historic Restoration."

2023 - present KATE LAUE

Member of MS committee. Thesis topic: "Infill Housing Prototypes for Portland, Oregon: Analysis of Land Use Regulations & Design Factors."

GE for project, "Mass Timber Prefabricated Panels for Affordable Housing Prototype Development."

2022 - present SOFIA CHAVEZ

GE for project, "Mass Timber Prefabricated Panels for Affordable Housing Prototype Development." Contributor to BioBE's Venice Biennale Transpecies Design Exhibition.

2023 - present BEN MICHEL

IHBE student worker. Contributor to ETO Panelized Housing Energy Analysis and Mass Timber Reuse projects.

2023 - present DANIEL ESSAIDES

IHBE student worker. Contributor to Forest to Facade Commercial Seismic + Energy Retrofits, Mass Timber Reuse and Mass Timber Acoustic Testing projects.

2023 - present VICTORIA CLARKE

IHBE student worker. Developing IHBE project using mycelium and wood fiber to create mass timber acoustic mat.

2023 LILIANA BARNATAN

Primary advisory, Clark Honors College. Thesis: "The built environment implications of *C. difficile* spore deposition from patients with hospital-associated *C. difficile* infections."

2022 - present MARIA CORONADO CABRERA

Member of PhD committee. Dissertation topic: "Teachers' Comfort and Wellbeing in Classrooms."

2019 - 2022 HOOMAN PARHIZKAR

Member of PhD committee. Dissertation topic: Role of architecture in COVID-19 spread indoors. Advised Hooman on investigation of microfern *Azolla* for bio-remediation of indoor air.

2021 - 2022 PAYTON NARANCIC

Member of MS committee. Thesis topic: Use of restoration forestry in local production of mass timber for California State Park structures. GE for project, "Development of mass plywood panels in seismic + energy facade retrofits."

2021 - 2022 SIMONE O'HALLORAN

Member of MS committee. Thesis topic: use of MPP mass timber for affordable large span structures. GE for MPP Housing Project.

2021 - 2022 AMANDA STANTON

Member of MS committee. Thesis topic: Reusing mass timber: an investigation of the opportunities and challenges.

student activity

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2020 - 2022 MCKENZIE VANKO

Advised McKenzie working on USFS Wood Innovations grant-funded "Wood in Healthcare Design Field Guide."

2021 - 2022 GEMMA FUCIGNA

IHBE student worker. Developing IHBE project using Nike Grind and mycelium to create mass timber acoustic mat.

2020 - 2022 ANDREW NEWBOLD

IHBE student worker. Developed system for testing Azolla on indoor air. Contributor to Nike Sustainable Materials Game Plan. Developed and fabricated microacoustic chamber for testing small-scale floor assemblies.

2020 - 2022 JAKE BRAWNER

IHBE student worker. Developed system for testing Azolla on indoor air. Contributor to *Nike Sustainable Materials Game Plan*. Cataloged materials for possible reuse in "Forest to Facade" seismic retrofit project. Developed mid-size acoustic testing chamber for White Stag.

2020 - 2021 FLYNN CASEY

GE for project, "Development of mass plywood panels in seismic + energy facade retrofits."

2020 - 2021 MATTHEW STOLL

IHBE student worker. Contributor of graphics to *Nike Indoor Environment Guide*.

2020 - 2021 DELANEY HETRICK

IHBE student worker. Contributor of graphics to *Nike Indoor Environment Guide*.

2020 - 2021 MARIN NAGLE

IHBE student worker. Contributor of graphics to *Nike Indoor Environment Guide*.

2020 - 2021 PALLAVI CHIDAMBARANATH

IHBE student worker. Contributor to *Carbon Narratives for Design Planning* project.

2020 - 2021 JOSH ROWELL

IHBE student worker. Contributor to *Carbon Narratives for Design Planning* project.

2019 - 2021 KATHERINE MARTIN

IHBE student worker. Contributor to *Spatial Wellness in the Workplace* project for Microsoft. GE for *Carbon Narratives for Design Planning* project.

2019 - 2021 MICHAEL YAUK

Advise architecture graduate student in Portland lab; Michael is investigating the thermal variability and randomness indoors on cognition, contribution of mass timber adhesives to indoor air.

2018 - 2020 CATHERINE EARLEY

Member of MS committee. Thesis topic: Hydrosocial cycle: the built environment's influence on urban watersheds. Advised as GE architecture student in Portland lab; Catherine investigated circadian lighting and human health.

2018 - 2020 LILY SUMMERS

Advise as GE architecture student in Portland lab; Lily is investigating the role of randomness in thermal variability on human cognition.

2019 SANDRA BYERS

IHBE student worker. Contributor to *Spatial Wellness in the Workplace* project for Microsoft.

architecture product conceptual design

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2019 YASMIN KAZEMINEJAD

Advise architecture graduate student in Portland lab; Yasmin is investigating mass timber lamination and sealant methods used in industry.

2019 OLIVIA BAIN

Faculty advisor for Oregon Applied Sustainability Internship (OASE) at Green Hammer Design Build, together with Jordan Palmeri and Peter Canepa of Oregon Department of Environmental Quality and Alex Boetzel of Green Hammer. During this internship, Olivia is investigating the lifecycle impact of single-family passive house construction versus Earth Advantage and code construction. Advised Olivia as graduate architecture student in Portland lab.

2018 ETHAN ZAGOREC-MARKS

Advised as graduate architecture student in Portland lab; Ethan investigated indoor acoustic health impacts.

2017-2018 DANIEL ROTH

Advised GE architecture student in Portland lab.

Creative Work, Architectural Design

2016 - 2017 11W MIXED-USE TOWER - Mix use tower with office, retail and luxury apartments in Portland's West End. Role: project designer for apartment units and penthouses together with Bekah Gomez. Project design principal: Gene Sandoval.

2017 GOOGLE SPRUCE GOOSE HEADQUARTERS - Renovation of core and shell of historic Spruce Goose hanger in Los Angeles with associated interior concept and tenant improvement. Role: project designer for construction documentation of interiors.

2015 - 2016 UNITED STATES EMBASSY IN ASUNCION, PARAGUAY - U.S. Embassy in Asuncion included the design of chancery, cabana, residential dorms, storage facilities, guard stations and botanical garden. Role: project designer responsible for site security planning, interior planning of chancery and renderings from schematic design through construction documentation.

2015 - 2016 OREGON HEALTH & SCIENCE UNIVERSITY CENTER FOR HEALTH AND HEALING SOUTH - "Ambulatory hospital" tower offering high-acuity multi-specialty care. This project was innovative in the new model of care for patients and delivery of design and construction which involved integrated project delivery and LEAN process improvements with diverse stakeholder groups. Role: project designer for Knight Cancer Institute from concept through construction documentation. Role involved working with diverse stakeholders and creating full-scale physical mock-ups to test and confirm new process improvements with architectural design.

2016 PROVIDENCE HEALTH OPERATING ROOMS AND INPATIENT ROOMS STANDARD - Organization wide architectural standards for operating rooms and inpatient rooms. Worked with diverse stakeholder groups using integrated design to develop best practice for process and associated architectural expression. Role: project designer through concept documentation.

2014 - 2015 THE PORTLAND CLINIC - Design and remodel of a multi-specialty clinic that involved LEAN process improvements across diverse stakeholder groups and full-scale physical mock-ups to inform and confirm process improvements with architectural design. Role: Lead project designer from concept, mock-ups through construction documentation.

architecture product conceptual design

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2014 GROCERY OUTLET HEADQUARTERS - Designed integrated art and graphic storytelling for headquarters. Role: integrated art concept, design and fabrication.

Creative Work, Product Design

2017 MOBILE ENVIRONMENTAL UNIT - The Mobile Environmental Unit or "MEU" is an adaptable office unit on wheels that can be used independently for working, meeting or aggregating multiple units to shape open office space. Originally initiated as a concept for a client interested in flexible working environments, the design was patented by ZGF and product development initiated by venture capital. Role: design and development together with project team Robert Petty and Robin Oglesbee-Venghaus, from version two to version four, including fabrication.

2016 METRO PEDIATRICS - Design and development of custom art, room signage and lighting for pediatric clinic together with project team: Robert Petty, Robin Oglesbee-Venghaus, Drew Carson, Yuri An. Role: Design of prototype room signage and fabrication of custom art panels.

Creative Work, Conceptual Design

2019 - present MASS PLYWOOD PANEL AFFORDABLE CLUSTER HOUSING - Design and development of affordable cluster housing using mass plywood panels and digitized off-site modular fabrication techniques. Role: (Co-PI) concept design through construction documentation, site planning and development. Co-contributors: Judith Sheine (Co-PI), Jason Stenson, Mikhael Gershfeld, Kate Laue, Simone O'Halloran.

2016 - 2017 HAUS ZUR EDELKASTANIEN - Design of single family courtyard passive house in Northwest regional vernacular for a site in Milwaukie, Oregon. Role: Lead project designer - concept through construction permit documentation.

2016 - 2017 PODIL LAKE DEVELOPMENT - Concept design and development of 2000 units of urban housing at a historic site in Kiev, Ukraine that included historic renovation of a former brick factory warehouse into art space, additional retail and urban planning. Role: architectural design, planning, development and physical / digital visualization. Additional project team: Vladamir Pajkic (principal), Otto Condon (project manager), Jade Jiambutr.

2016 FACEBOOK HOTEL - Concept design for hotel on Facebook's campus in Menlo, California. Role: architectural design, planning, development and physical / digital visualization. Additional project team: Vladamir Pajkic (principal), Sean Wittmeyer and Kurt Chiusolo.

2016 801 NEW JERSEY MIXED-USE DEVELOPMENT - Concept design for mixed-use office, residential and retail space in Washington DC. Role: architectural design, planning, development and physical / digital visualization. Additional project team: Vladamir Pajkic (principal) and Kurt Chiusolo.

2015 IVON STREET - Concept design of REI retailer space in Portland, Oregon. Role: Visualizations. Project designer: Randy McGee.

2013 NORDIC HERITAGE MUSEUM - Concept design and development for net zero energy Nordic Heritage Museum in Seattle, Washington that employs passive strategies for ventilation and humidity control. Role: MArch Thesis project together with Brad Smith, Jesse Banks.

awards

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2023 SUSTAINABILITY AWARD FOR INNOVATION AND IMPACT
University of Oregon, Office of the Vice President for Research and Innovation

2020-2021 HEALTH IN BUILDINGS ROUNDTABLE SCHOLAR
National Institutes of Health

2020 COVID-19 RESEARCH INNOVATION AWARD
University of Oregon
Honored among a group of 22 faculty members for COVID-19-related research innovation efforts.

2020 "MOST READ ARTICLE IN MSYSTEMS JOURNAL"; "EDITOR'S PICK MSYSTEMS JOURNAL"; "TOP 10 MOST READ ARTICLES IN AMERICAN SOCIETY OF MICROBIOLOGY." 2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission, mSystems; Leslie Dietz, Patrick F. Horve, David A. Coil, Mark Fretz, Jonathan A. Eisen, Kevin Van Den Wymelenberg.

2006 ACHIEVEMENT MEDAL
United States Public Health Service Commissioned Corps
Awarded medal for exemplary performance of duty

2006 UNIT COMMENDATION
United States Public Health Service Commissioned Corps

2004 NATIONAL DIRECTOR'S AWARD
Indian Health Service
Recognized for outstanding performance, dedication, and commitment to the mission of the Indian Health Service

2004 NATIONAL DIRECTOR'S AWARD
Indian Health Service
Recognized for outstanding performance, dedication, and commitment to the mission of the Indian Health Service

press

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Popular Press

“UO RESEARCHERS MINT A FRESH DISCOVERY ABOUT THE SPREAD OF DISEASE,” KLCC / NPR All Things Considered, February 21, 2023. <https://www.klcc.org/health-medicine/2023-02-21/uo-researchers-mint-a-fresh-discovery-about-the-spread-of-disease>

“UNIVERSITY OF OREGON RESEARCHERS STUDY SOCIAL DISTANCING WITH BREATH MINTS,” ABC News, KEZI, February 20, 2023. https://www.kezi.com/news/university-of-oregon-researchers-study-social-distancing-with-breath-mints/article_318e8fc0-b177-11ed-80f9-9b666b4aa472.html

“COULD COVID-19 USHER IN THE AGE OF CLEAN INDOOR AIR?”
Quartz, April 11, 2021.
<https://qz.com/1993935/could-covid-19-usher-in-the-age-of-clean-indoor-air/>

“TO MAKE A BUILDING HEALTHIER, STOP SANITIZING EVERYTHING.”
Bloomberg Businessweek, December 21, 2020.
<https://www.bloomberg.com/news/features/2020-12-16/covid-pandemic-microbiomes-could-be-key-to-stopping-spread-of-future-viruses>

“DESIGN FOR HEALTH: STUDENT PROJECTS EXPLORE THE UNSEEN.”
Around the O, December 11, 2019.
<<https://around.uoregon.edu/content/design-health-student-projects-explore-unseen>>

“KEEPING PORTLAND GREEN - INSTITUTE FOR HEALTH IN THE BUILT ENVIRONMENT HELPS LAUNCH SUSTAINABLE BUILDING WEEK.”
UO College of Design / School of Architecture and Environment, October 9, 2018.
<<https://archenvironment.uoregon.edu/keeping-portland-green-institute-health-built-environment-helps-launch-sustainable-building-week>>

“NEW INSTITUTE INTEGRATES DIVERSE DISCIPLINES TO DESIGN HEALTHIER BUILDINGS.”
UO College of Design / School of Architecture and Environment, March 21, 2018.
< <https://design.uoregon.edu/new-institute-integrates-diverse-disciplines-design-healthier-buildings>>

“NEW INSTITUTE WILL FIND NEW WAYS TO BUILD HEALTHY INDOOR SPACES.”
Around the O, April 24, 2018.
< <https://around.uoregon.edu/content/new-institute-will-find-new-ways-build-healthy-indoor-spaces>>

“RESEARCH FOCUSING ON HEALTH IN BUILDINGS.”
DJC Oregon, April 11, 2019.
< <https://djcoregon.com/news/tag/energy-studies-in-buildings-laboratory/>>

“WOOD ON THE BLOCK.”
Portland Business Journal.

service

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Administrative Service

2022 - present OREGON iSECTOR RESEARCH WORKGROUP FOR THE HOUSING INNOVATION PARTNERSHIP

2019 TALLWOOD DESIGN INSTITUTE SEARCH COMMITTEE, member on Oregon State University / University of Oregon search committee for Emmerson Lab Technical Manager

2019 TALLWOOD DESIGN INSTITUTE SEARCH COMMITTEE, member on Oregon State University / University of Oregon TallWood Design Institute search committee for Emmerson Lab Structural Testing Coordinator

Community Service

2019 WESTERN FARM WORKERS ASSOCIATION, volunteer

2006 - 2010 INDIAN HEALTH SERVICE dental services to Native American populations from tribes across the continental U.S. and Alaska at Chemawa Indian School

2003 - 2006 INDIAN HEALTH SERVICE dental services to Confederated Tribes of Warm Springs at the Warm Springs Health and Wellness Center.

2003 KC CARE CLINIC, dental services to underserved patient populations at a free health clinic, Kansas City, Missouri

2002 - 2003 SAMUEL U. RODGERS HEALTH CENTER, dental services to underserved patient populations at a Robert Wood Johnson clinic, Kansas City, Missouri

2001 - 2003 UNIVERSITY OF MISSOURI-KANSAS CITY dental services to underserved patient populations in rural and urban Missouri communities

licenses

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mfretz@uoregon.edu

2013 - present ASSOCIATE MEMBER
American Institute of Architects

2009 - 2021 STATE OF OREGON
Dental license (retired)

2003 - 2009 STATE OF KANSAS
Dental license (retired)

2003 - 2015 DRUG ENFORCEMENT AGENCY
Schedule II Controlled Substance license (retired)