

Eduardo Molina Montoya, Ph.D.

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EDUCATION

- Ph.D. in Forestry and Forest Products. Virginia Tech. 2020
Dissertation Title: Modeling of the fundamental mechanical interactions of unit load components during warehouse racking storage
- M.S. in Forestry and Forest Products. Virginia Tech. 2017
Thesis Title: Investigation of Pallet Stacking Pattern on Unit Load Bridging
- B.S. in Industrial Engineering. Costa Rica Institute of Technology. 2012.

CERTIFICATIONS

- Certified Packaging Professional (**CPP**). IoPP.
- Certified Thermal Professional (**CTP**). ISTA.
- Certified Packaging Dynamics Professional (**ISTA PDP**). ISTA.

PROFESSIONAL EXPERIENCE

2023 – Current	Assistant Professor in Packaging , Department of Sustainable Biomaterials, Virginia Tech
2021 - Current	Associate Director for Packaging Materials Testing , Center for Packaging and Unit Load Design, Department of Sustainable Biomaterials, Virginia Tech
2022 – 2022	Collegiate Assistant Professor , Department of Sustainable Biomaterials, Virginia Tech
2018 – 2022	Instructor , Packaging Systems and Design, Department of Sustainable Biomaterials, Virginia Tech
2018 – 2020	Manager , Laboratory for Corrugated Packaging Testing, Department of Sustainable Biomaterials, Virginia Tech
2015 – 2017	Laboratory Supervisor , Center for Packaging and Unit Load Design, Department of Sustainable Biomaterials, Virginia Tech
2011 – 2015	Supply Planning Analyst , Kimberly Clark Corporation

OTHER RELEVANT APPOINTMENTS

2025 – Current	Cold Chain Packaging Scientific Advisor , GCCF Council of Scientific Advisors (CSA), Global Cold Chain Foundation
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PUBLICATIONS

Peer-reviewed journals

- Kim, S., Horvath, L., **Molina, E.**, Frank, B., Johnson, S., & Johnson, A. (2023). Predicting the effect of pallet overhang on the box compression strength. *Packaging Technology and Science*, 36(11), 927–939. <https://doi.org/10.1002/pts.2768>
- **Molina, E.**, & Horvath, L. (2021). Development of a Gaussian Process Model as a Surrogate to Study Load Bridging Performance in Racked Pallets. *Applied Sciences*, 11(24), 11865. <https://doi.org/10.3390/app112411865>
- **Molina, E.**, Horvath, L., & West, R. L. (2021). Development of a Friction-Driven Finite Element Model to Simulate the Load Bridging Effect of Unit Loads Stored in Warehouse Racks. *Applied Sciences*, 11(7), 3029. <https://doi.org/10.3390/app11073029>
- **Molina, E.**, Horvath, L., & White, M. S. (2018). Investigation of pallet stacking pattern on unit load bridging. *Packaging Technology and Science*, 31(10), 653–663. <https://doi.org/10.1002/pts.2406>

Technical forums presentations and proceedings

- Hassan, A. & **Molina, E.** (2025) Predicting the Thermal Performance of Bio-Based Cold Chain Packaging Systems Through Finite Element Modeling. *ISTA Forum 2025 TempPack*. Orlando, Florida, USA.
- Makwana, H. & **Molina, E.** (2025) Prediction modelling of pallet overhang on box compression strength. *32nd IAPRI Member's Conference*. Roanoke, Virginia, USA.
- Hassan, A. & **Molina, E.** (2025). Predicting the Thermal Performance of Bio-Based Cold Chain Packaging Systems Through Finite Element Modeling. *32nd IAPRI Member's Conference*. Roanoke, Virginia, USA.
- Sood, M., Silva, M, Song, K., & **Molina, E.** (2025) Impact of Relative Humidity on the Thermal Efficiency of Fiber-Based Insulated Shipping Containers. *ISTA Forum 2025 TempPack*. Orlando, Florida, USA.
- **Molina, E.** (2024) Analysis of Consumer Preferences and Operational Execution in a Global Environment for Direct-From-Store Deliveries. *24th World Packaging Conference. IAPRI Valencia 2024*. Valencia, Spain.
- **Molina, E.**, Johnson, A., Weston, Z., Bright, M., & Niu, J. (2023). Investigation of Last-Mile Grocery Delivery in a Suburban Environment. *ISTA Forum 2023 TransPack*. Houston, Texas, USA.
- **Molina, E.** & Horvath, L. (2022) Investigation of the consumer perceptions of e-commerce packaging. *23rd World Packaging Conference. IAPRI Bangkok 2022*. Bangkok, Thailand.
- **Molina, E.** & Horvath, L., & West, R. L. (2022). Development of a friction-driven finite element model to simulate the load bridging effect of unit loads stored in warehouse racks. *23rd World Packaging Conference. IAPRI Bangkok 2022*. Bangkok, Thailand.

- Molina, E. (2017). The effect of pallet stacking patterns on the deflection of the pallet under common support conditions. Proceedings of the *ISTA Transport Packaging Forum*, March 16 to 19, 2017. Orlando, Florida.

TEACHING

I have developed teaching materials for undergraduate students as well as external professional audiences. Classes have had sizes between six and fifty students, been on campus and on-line on multiple different topics in diverse areas related to packaging.

- SBIO 1014 – Introduction to Packaging Systems and Design
- SBIO 2004 – Computer-Aided Design in Packaging
- SBIO 3005/3006 - Sustainable Packaging Design
- SBIO 3224 – Packaging Distribution Systems:
- SBIO 3244 – Packaging Machinery and Production Systems
- SBIO 3264 – Packaging Supply Chain, 3 credits
- SBIO 3464 – Sustainable Operations Management
- SBIO 4224 - Industrial Packaging Systems
- SBIO 5104 Packaging Development

SPONSORED RESEARCH AND EXTERNAL CONTRACTS

Select Competitive Grants

- Impact of Relative Humidity on the Thermal Efficiency of Fiber-Based Insulated Shipping Containers. Sponsored by International Safe Transit Association (ISTA). Awarded 2024 (PI)
- Mapping of the Grocery Delivery to Home Process and Hazards in a Suburban Environment. Sponsored by International Safe Transit Association (ISTA). Awarded 2023 (PI)
- Development of a systematic methodology to enable the wide adoption of fiber-based insulation in passive shipping containers. 4-VA Pre-Tenure Faculty Research Grant. Awarded 2022 (PI)
- Effect of Pallet Overhang on Box Compression Strength. Sponsored by International Corrugated Packaging Foundation and the Fibre Box Association. Awarded 2022 (Co-PI, 50%)
- Effect of Pallet Overhang on Box Compression Strength – Phase 2. Sponsored by International Corrugated Packaging Foundation and the Fibre Box Association. Awarded 2024 (PI)
- Investigation of Packaging Opportunities for Store-to-Consumer Distribution in Walmart's Supply Chain. Sponsored by Walmart Inc.

Select Examples of Other Research Projects

- Evaluation of the performance of fiber-based trays for fresh fruit and vegetable packaging. Westrock Corporation. 2023
- Exploration of Sustainable Insulation Material and Package Design. Virginia Tech Undergraduate Research Study. Spring 2023. (PI)

- The Effect of Vacuum Sealing on the Quality of Moose Knuckles Jackets. Moose Knuckles. 2023. (PI)
- Study of the Suitability and Redesign of Packaging Solutions for e-Commerce Cold-Chain Distribution Channels. Sponsored by McKesson Corporation. Spring 2022. (PI)
- Study of the Suitability and Redesign of Packaging Solutions for e-Commerce Cold-Chain Distribution Channels. Sponsored by Smurfit Kappa. Fall 2021. (PI)
- Package Assessment Methodology Based On Consumer Perceptions Of E-Commerce Packaging. Sponsored by Smurfit Kappa. Spring 2021. (PI).
- Development of a Simplified Method to Evaluate Fastener Properties for Pallet Joints. Center for Packaging and Unit Load Design at Virginia Tech Undergraduate Research Study. 2023. (PI)
- Evaluation and comparison of the test methods to determine the coefficient of friction of pallets. Center for Packaging and Unit Load Design at Virginia Tech Undergraduate Research Study. 2023. (PI)

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

- International Safe Transit Association, Certified Thermal Professional I (CTP)
- International Safe Transit Association, Certified Packaging Dynamics Professional (PDP)
- Institute of Packaging Professionals, Elite Member
- IoPP – Packaging Sustainability Technical Committee – Contributor and member
- ISTA – PharmaCommittee Member

LANGUAGE PROFICIENCY

- Spanish (native), English, and German.