**Bio-based Building Envelope Retrofit System**

2022 MASBio Undergraduate Summer Research Opportunity

**Faculty:** Dr. Paul Crovella

**Project Site:** Wood Products Testing Lab (<https://crovella.weebly.com/research.html>), SUNY-ESF

**Project:** Bio-based building envelope retrofit system

**Brief Description:** The need to address climate change and forest carbon management use has never been greater. Simultaneously, many residents of urban communities live in homes that provide poor thermal comfort due to their age of construction. This project will connect the products from a working forest (wood substrate panels and wood fiber insulation) with the needs to reduce energy use and carbon emissions, to sequester carbon in the building stock and reduce energy expenses for communities. The bio-based panel will be an overcladding system which can be installed on the facades of existing buildings to encapsulate the walls and provide a 30-40% reduction in building heat loss. The project will use existing supply chains from the sawmills in the Mid-Atlantic to create a Cross Laminate Timber (CLT) substrate for the assembly. The insulative layer will be produced from wood fiber insulation, commonly used in Europe, and scheduled to be produced in the Northern Forest region. The panel design and fabrication will be performed off-site, based on a laser-scanned point cloud captured from the existing structure. The onsite installation will be aided by the relatively light weight of the system. The panels will be instrumented and field tested to confirm their modelled hygrothermal (heat, air, moisture) performance. Lifecycle assessments and economic analyses will be performed. Results from this work will be shared in publications and conferences.

The outcomes of this work will be helpful to the MASBio project lay the groundwork for low value wood fiber in insulation and structural products.

**Background Required:** Educational background in either of Agricultural, Civil, or Mechanical Engineering, forest biomaterials, construction/ construction science, or wood science and technology. Knowledge of wood laboratory operations would be a plus.

**Additional Details**:

* All students are expected to participate in person at SUNY ESF in Syracuse, NY for the duration of the program (Monday May 23 – Friday July 29, 2022)
* The stipend for this summer research opportunity is $6,000.
* The program will include field trips to biomass/bioenergy partners and facilities in the region. Transportation will be provided for these activities.
* Housing is available for the 10 week period in the dorm at ESF at a cost of $1,000 (<https://www.esf.edu/welcome/campus/centennial.htm>)

**Application:**

Submit your resume, a statement of interest (maximum of one page), college transcripts (unofficial is acceptable) and two reference letters for review to: Dr. Timothy Volk, 306 Bray Hall SUNY ESF, Syracuse, NY 13210 or tavolk@esf.edu.