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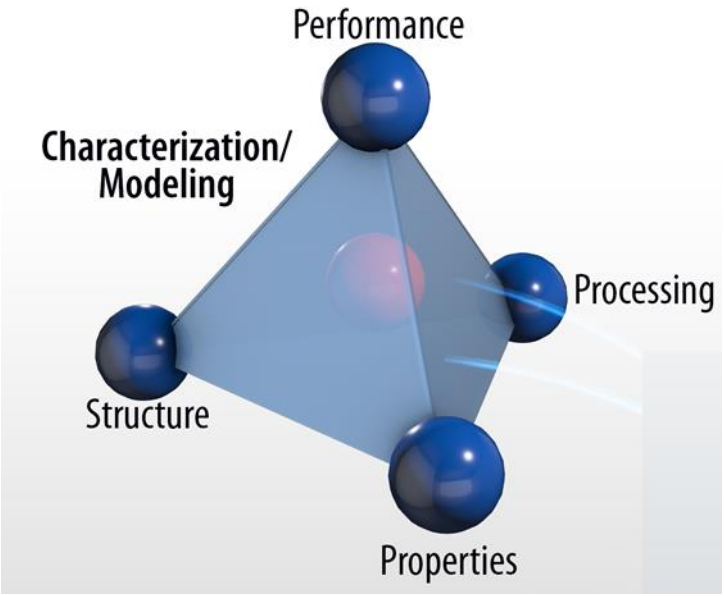
NATIONAL RENEWABLE ENERGY LABORATORY

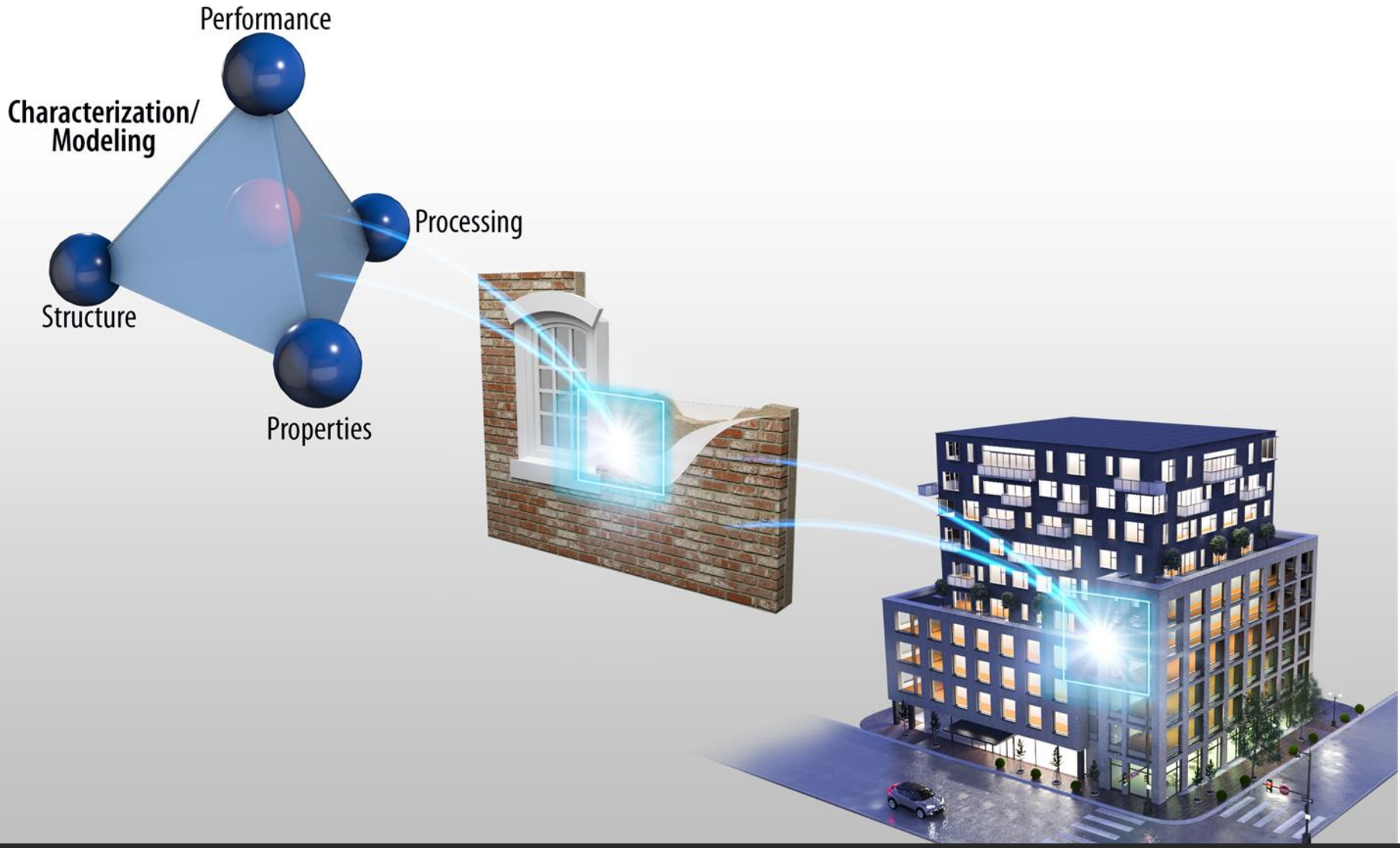
GEB Components: Building Envelope

Roderick Jackson, Ph.D.
Laboratory Program Manager for Buildings Research
May 2, 2018

How Do We Translate Next Generation Materials Science



How Do We Translate Next Generation Materials Science into GEB Innovation



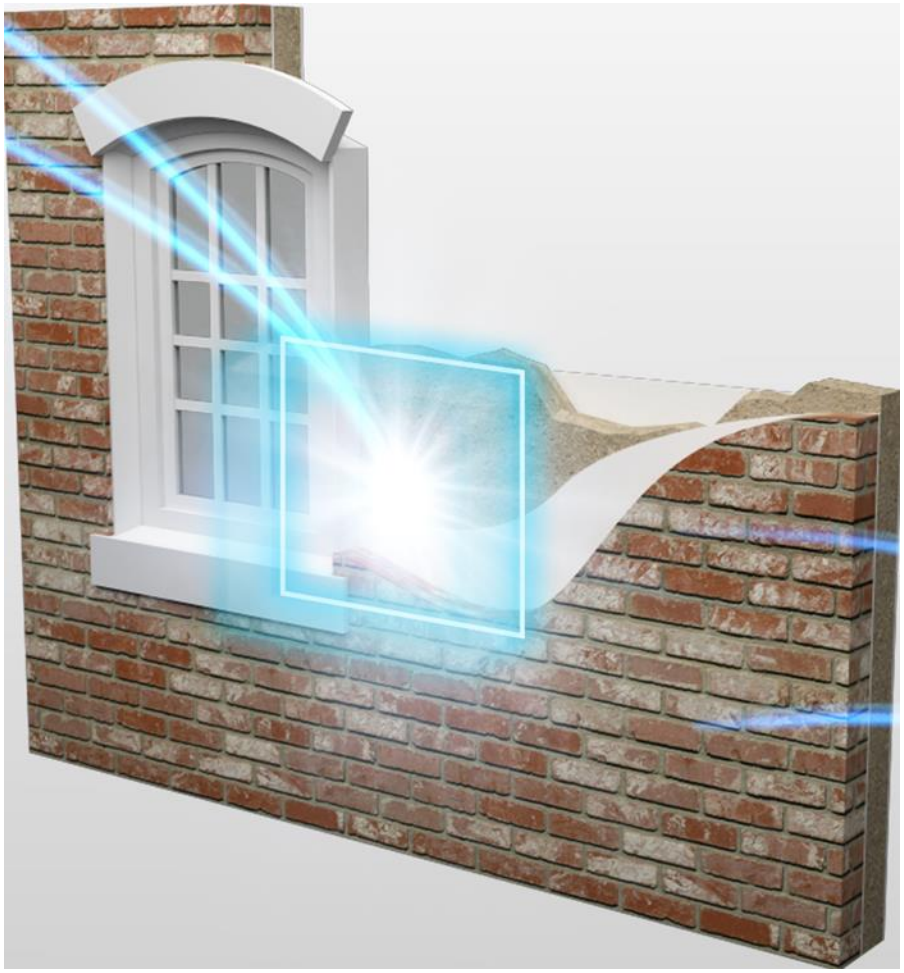
The Integration Science Challenge is > 10^{10}

From Material Functionality To Grid Services

Reaction Time?

Response Duration?

Anisotropy?



Charge Rate?

Discharge Rate?

Storage Time?

Energy Capacity Sensing and Control?

A New Paradigm for Photons

Good window OR Good solar panel: Why not both?

Dynamic windows

SageGlass
view
suntuitive by PLEOTINT
GENTEX CORPORATION

~20+ year ROI!
No energy generation

Solar windows

Transparent

ubiquitous energy

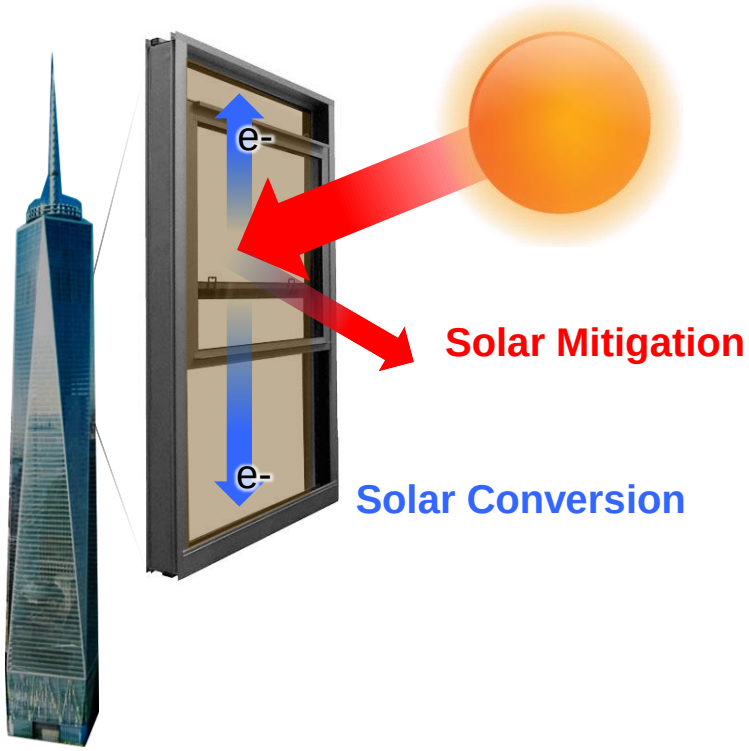
4% IR lab efficiency
2.5% UV theory efficiency

Semitransparent

onyx
UbiQD
SOLAR WINDOW TECHNOLOGIES, INC

Harnessing the Value of Photon Management in Buildings

Commercial



Wheeler, Lance M., et al. "Switchable photovoltaic windows enabled by reversible photothermal complex dissociation from methylammonium lead iodide." *Nature communications* 8.1 (2017): 1722.

Thank You

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