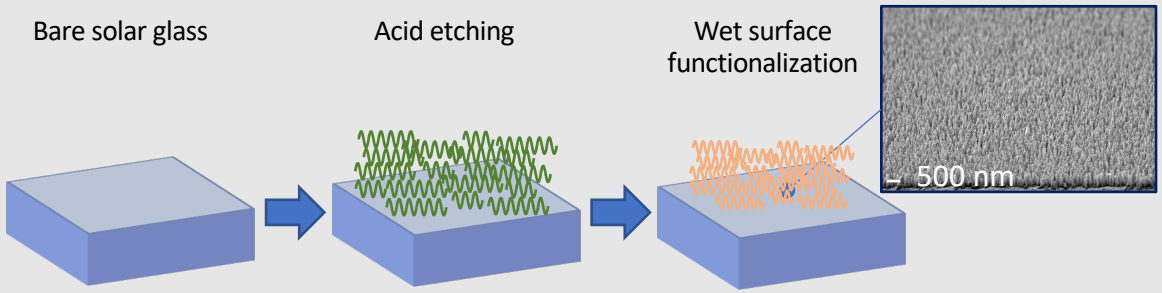
Durable Antireflective, Anti-Soiling, and Self-Cleaning Glass for Solar Modules

Efficiency Loss Issues

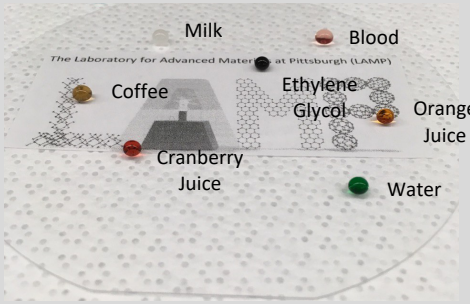
Reflection at the air/glass interface due to an instantaneous change in the index of refraction

Soiling from particulates/pollutants lead to as much as ~60% efficiency loss!

Low cost, Facile, and Scalable Process



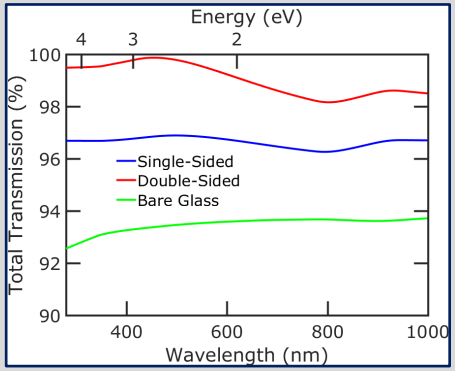
Anti-Soiling and Self-Cleaning



Superomniphobic glass repellent to a wide array of liquids and particles

Particulates adhere weakly to surface and are easily removed by dew condensation

Antireflection



Broadband and **broad angle** antireflection

Grade the index of refraction between air and glass

Irregular like nanostructures on the glasswing butterfly

Proposed Work

Develop **low cost**, facile, and scalable wet chemistry methods for creating low surface-energy, textured glass

Demonstrate **broadband** and **broad angle antireflection**

Demonstrate high repellency of water

Demonstrate **anti-soiling** and **self-cleaning** properties.

Demonstrate mechanical abrasion **durability.**

Key Personnel/Organizations

Pitt
Dr. Paul W. Leu
Sajad Haghanifar
Sooraj Sharma

Corning
Dr. Carl E. Crossland

NETL
Dr. Paul Ohodnicki
Dr. Bryan D. Morreale