



# Chavier McDaniel

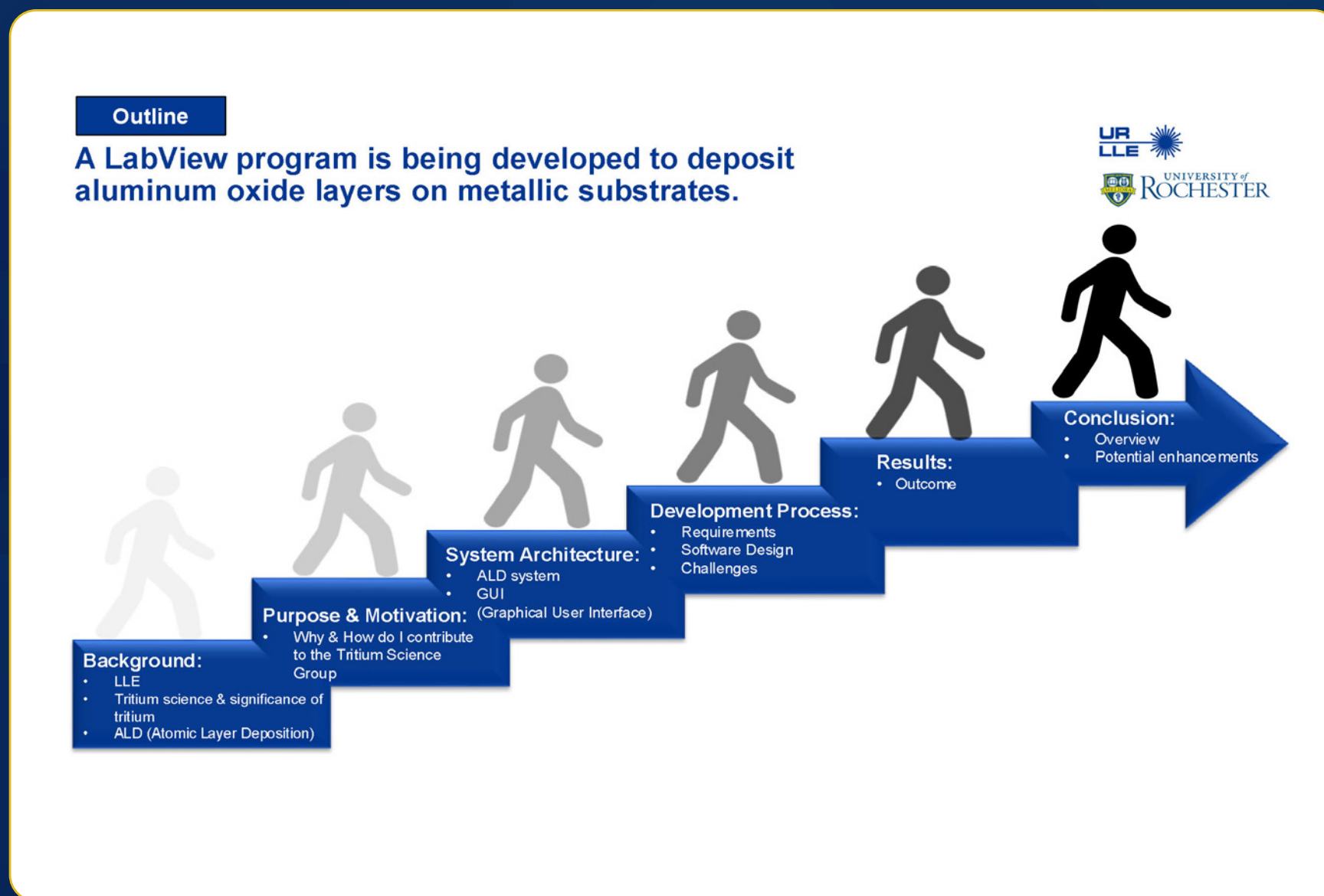
Frazier/Whiting Award  
 Mathematics/Physics Major  
 Second Year ARCS Scholar



# MOREHOUSE COLLEGE

## LabVIEW meets ALD: Enhancing Tritium Science with Advanced Diagnostics and Control

A LabView program is being developed to deposit aluminum oxide layers on metallic substrates.



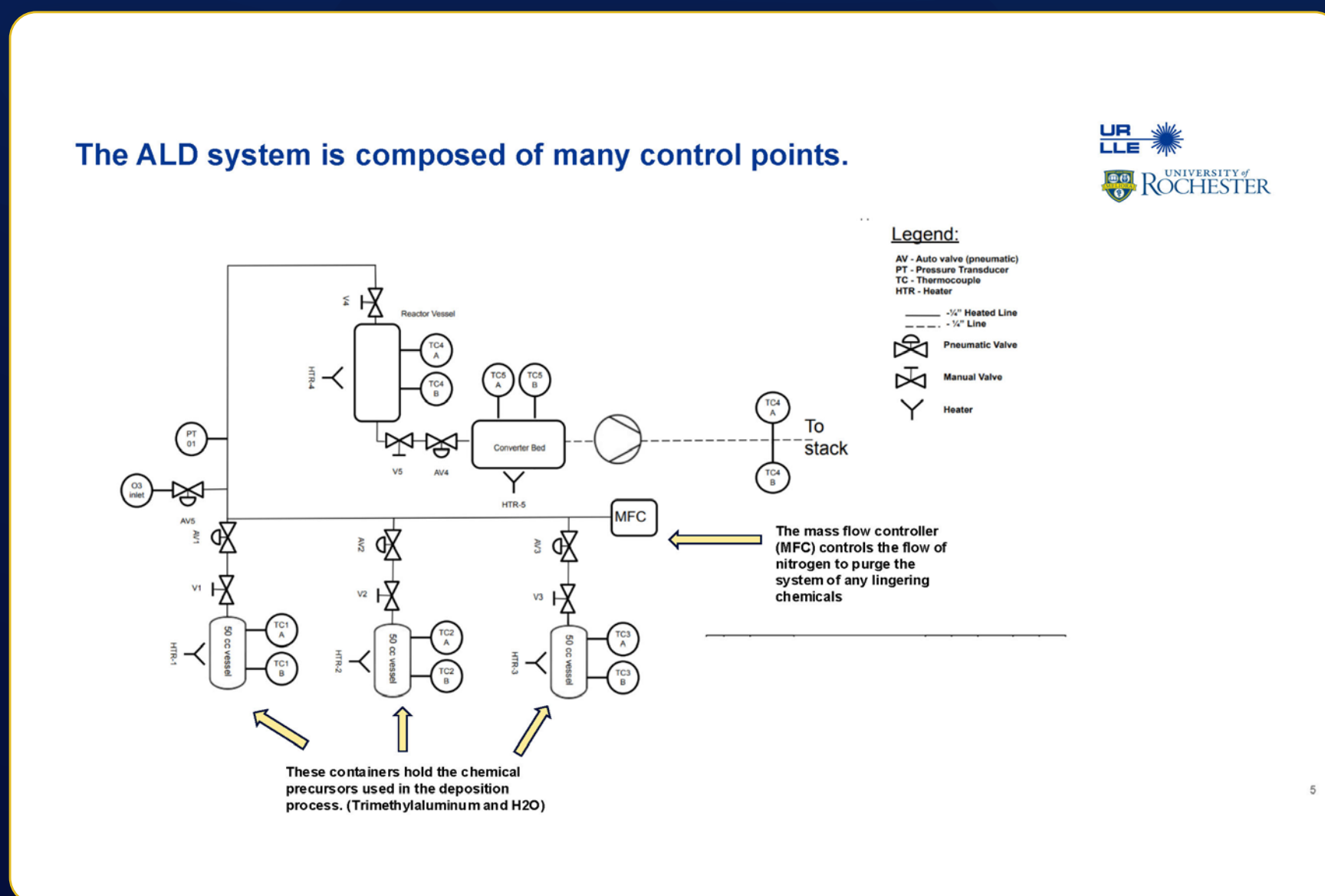
The development of a hydrogen permeation barrier on metals is a critical technology required to develop a fusion reactor.

**ISOTOPES OF HYDROGEN**  
 Protium  
 Deuterium  
 Tritium

• A team of over 150 scientist LLE  
 • Its a national laboratory is dedicated to the advancement of fusion, high-energy density science, laser technologies, and fundamental plasma physics.

• Tritium is a hydrogen isotope crucial for fusion, combining with deuterium to produce high-energy plasma.  
 • Tritium is radioactive and requires careful containment and handling due to its unstable nature.

• Effective tritium adsorption inhibition is critical for future fusion reactors and gas purification systems.  
 • ALD offers precise atomic-level control, crucial for applying thin pinhole free layers to inhibit tritium adsorption.



Goal is to deliver a practical and efficient control system tool to the tritium science group for precise diagnosis and ALD safety.

**Safety Oversight:**  
 Emphasis on safety before, during and after the ALD process.

**Accurate Diagnosis:**  
 Facilitate precise diagnosis to maintain control of the ALD machine for investigating tritium permeation barriers.

**Enhanced Connectivity:**  
 Improve the interface between the scientist and the instruments using LabVIEW's integrated user interface for system control applications.

