Reaction Engineering by Applying Molecular Principles Westmoreland group: GRAs Adam Dumas, Tim Mallo, Claire Murphy, UGRAs Rachel Crouse, Alex Lambrecht, Hrishi Ram, Nick Zezza

Why?

- As ChEs, we apply the molecular sciences -- chemistry, biology, and materials science.
- As researchers, we create discoveries and innovations.



Technological impacts:

- Preventing and destroying pollutants from fuels and PFAS.
- Recycling polymers thermally.
- Biomass conversion to liquid fuels and their clean use.
- New homogenous catalysts.
- Chemical looping for manufacturing.
- Ozone-safe and GWP-safe fluorocarbon refrigerants.

Chemical and Biomolecular Engineering Department, 2024 Centennial Year

The Westmoreland group discovers **Reaction kinetics** and mechanisms to advance energy and sustainability

> For more about our research and group:



www.cbe.ncsu.edu/westmoreland







• Create accurate molecular mechanisms using computational quantum chemistry and data science:

Apply in reactive-flow modeling

Our recent exciting development: New reactions to improve incineration of **PFAS** "forever chemicals":