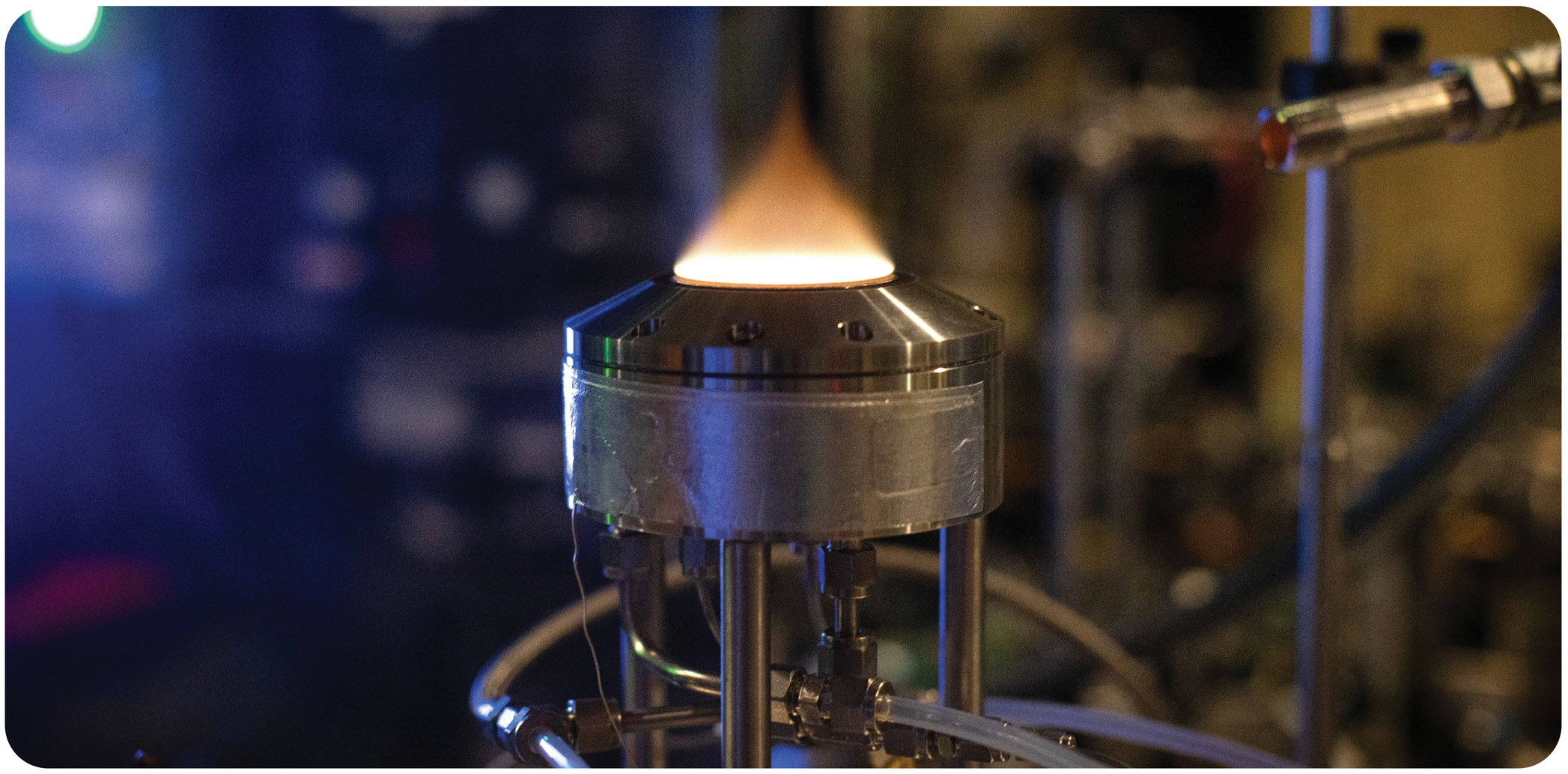
# NETL Achieves First In-Situ Measurements of Ammonia Flames

*NETL characterized the gas composition of ammonia flames using novel measurement techniques directly within the flame. These data are critical in validating models to be used to develop optimized $NO_X$ control schemes.*



**The Advanced Combustion Laboratory allows researchers to take in-situ measurements in flames, which can be used to validate computational models of ammonia-based combustion schemes.**

These measurements represent some of the first in-situ species data collected for ammonia flames not relying on extractive sampling techniques. The data collected is critical to validating kinetic models and developing ammonia-based combustion schemes for power and industrial applications, such as gas turbines. These data are important for studying the “rich-quench-lean” (RQL) strategy for burning ammonia, which consists of the following steps:

1. A rich-burn phase (fuel content is greater than stoichiometric) partially oxidizes ammonia and creates hydrogen.
2. A secondary air injector fully burns through the hydrogen and remaining ammonia.

Addressing $NO_X$ emissions remains one of the biggest challenges of utilizing ammonia as a fuel, and the RQL approach has shown promise as a low-$NO_X$ strategy for ammonia. An important consideration for making this scheme work is understanding the fundamental kinetics, which the in-situ measurement technique enables by gathering data at representative conditions.

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