

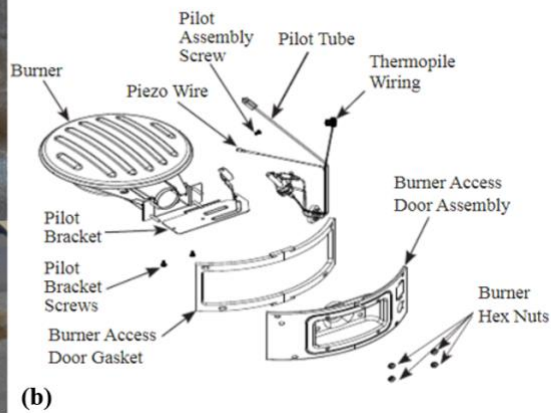
## UCI CI-SS Laboratory Exercise

### Flashback

With increased interest in decarbonizing fuel, hydrogen or hydrogen blended with natural gas is gaining interest as an alternative fuel. In order to achieve low emissions, it is common to pre-mix the fuel and air prior to combustion and to operate with excess air so that the overall mixture is fuel lean. By operating lean and well mixed, combustion temperatures can be tempered and, if held low enough, can result in very low NO<sub>x</sub> emissions. This is the principle by which “ultra-low NO<sub>x</sub>” residential and commercial water heaters operate on. These burners feature fuel and air stabilized to some extent by a screen mesh. Examples of such a burner are shown below

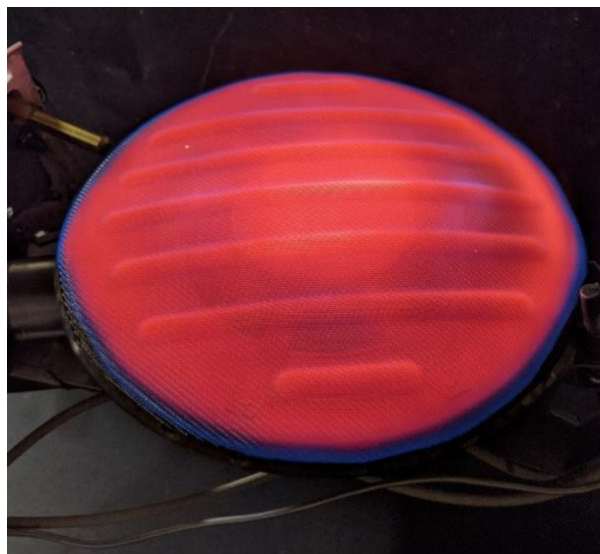


Residential Water Heater



(b)

Burner from Water Heater



Burner in Lean Premixed Operation (Natural Gas)