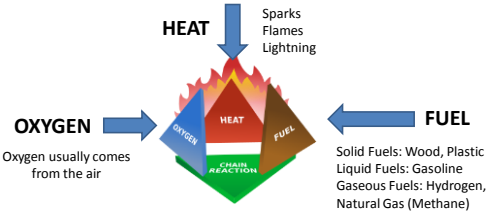
UNIVERSITY OF MARYLAND
Department of Fire Protection Engineering

Flames

What is Fire?

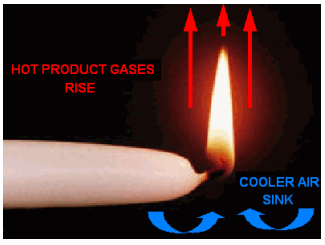
- Fire is a **chemical chain reaction** of a **fuel** and **oxidizer** releasing **heat**



A flame seems *SIMPLE*, why study it?

- Several processes involved:
  - Chemical Kinetics
  - Fluid Dynamics
  - Heat Transfer
  - Thermodynamics

Buoyancy in the Candle Flame



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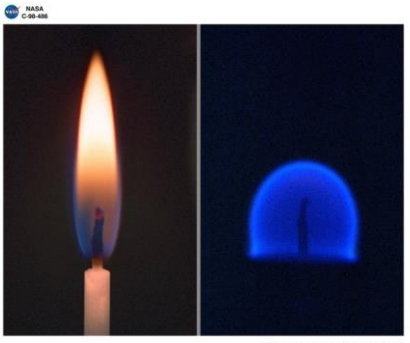
Buoyancy in the Candle Flame



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Lets look “inside” a flame!

- What is inside?
  - Fire? Air? Fuel? Nothing?

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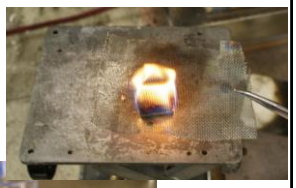
The Interior of a Flame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"Cut the Flame"

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Summary

- Ignition of fires need heat, fuel, air and chain reaction
- Suppression can be done by removing one of those four entities
- Flames behave according to physical and chemical mechanisms

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