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# Introduction to High Explosives Science

Santo Niño Regional Catholic School (sixth-grade)  
Bradbury Science Museum



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November 17, 2016

# EXPLOSION

# ATOMS

# Carbon (C)

- **Strong, silent, steady, solid**
- **The backbone of life on planet Earth**
- **Happy alone and under many conditions**
  - Ugly as soot or beautiful as diamond
  - Lubricating influence or hard as rock
- **Plays well with other atoms**
  - Hydrogen
  - Nitrogen
  - Oxygen
- **Serves as fuel in explosives, gets burned up**

# Hydrogen (H)

- **Small, light, bubbly, mobile, “everywhere”**
- **Essential to life on Earth**
- **Very unhappy alone**
- **Very happy as a couple, with another H atom**
- **Unusually strong relationship with oxygen**
  - Water (two hydrogen atoms + one oxygen atom)
  - Liquid
  - Gas
- **Partners well with nitrogen and carbon in explosives**



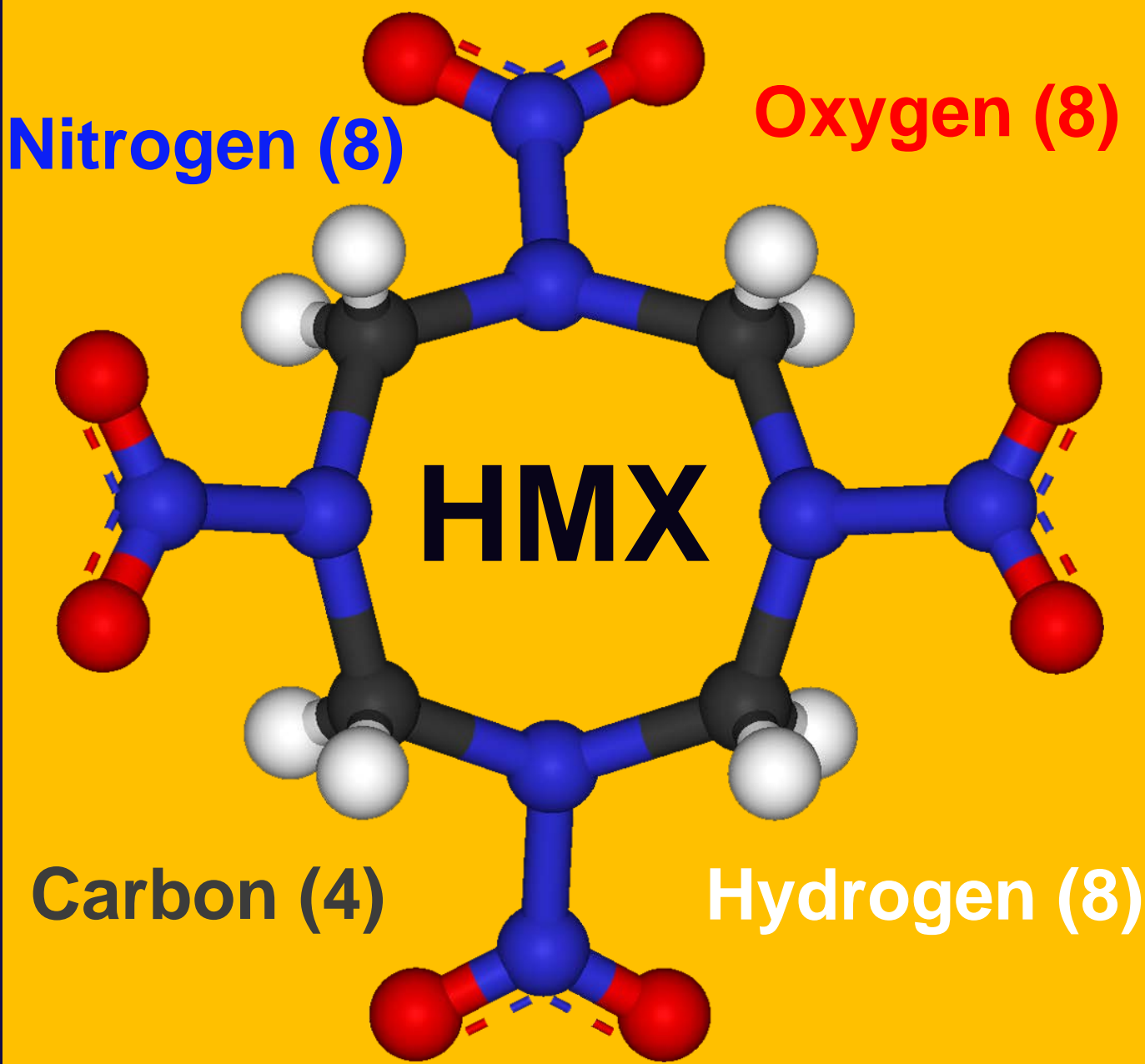
# Nitrogen (N)

- Cool, calm, collected
- Most abundant atom in our atmosphere (gas)
- A stable cousin to oxygen
- Very unhappy alone
- Most happy as a couple, with another N atom
- Reasonably happy with one or two O cousins
- Not as reactionary, big, or bossy as oxygen
- Plays “peace keeper” role in explosives, separating other atoms until bang time

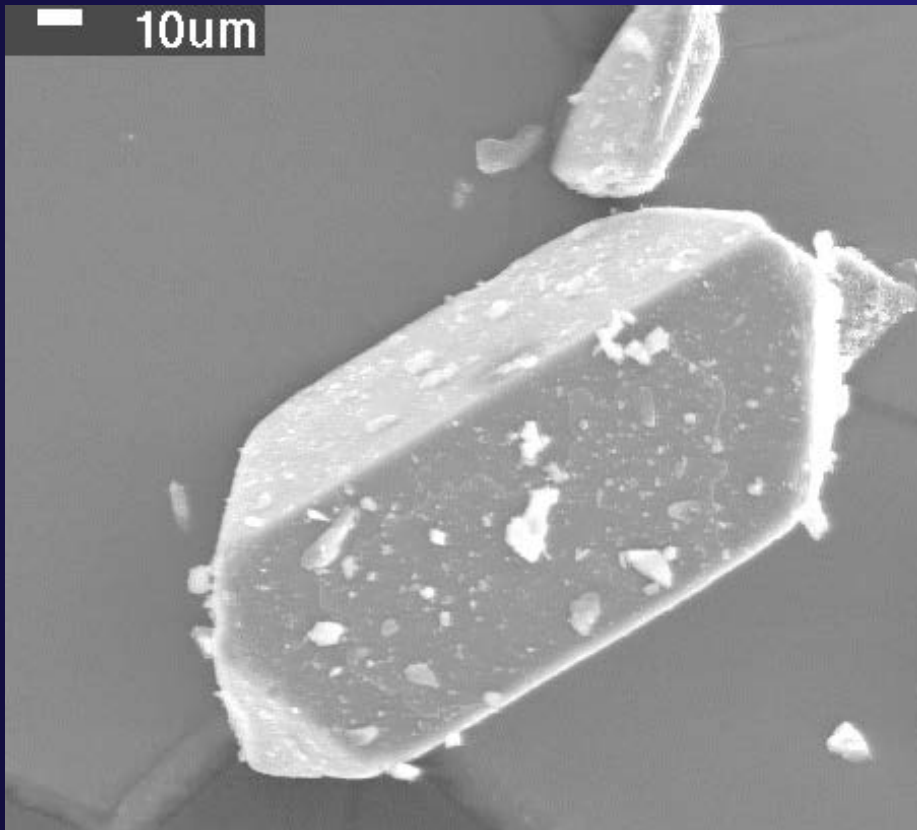
# Oxygen (O)

- Aggressive, energetic, outgoing, clingy
- Essential to life on Earth
- Very unhappy alone
- Very happy as a couple, with another O atom
- Very reactionary, big and bossy, seeking connections with everybody, getting in the way
- Sometimes the life of the party (air to breathe)
- Sometimes an unwelcome guest (burning)
- A good explosive has the “right” number of oxygen atoms to achieve a healthy balance.

# MOLECULES



# CRYSTALS







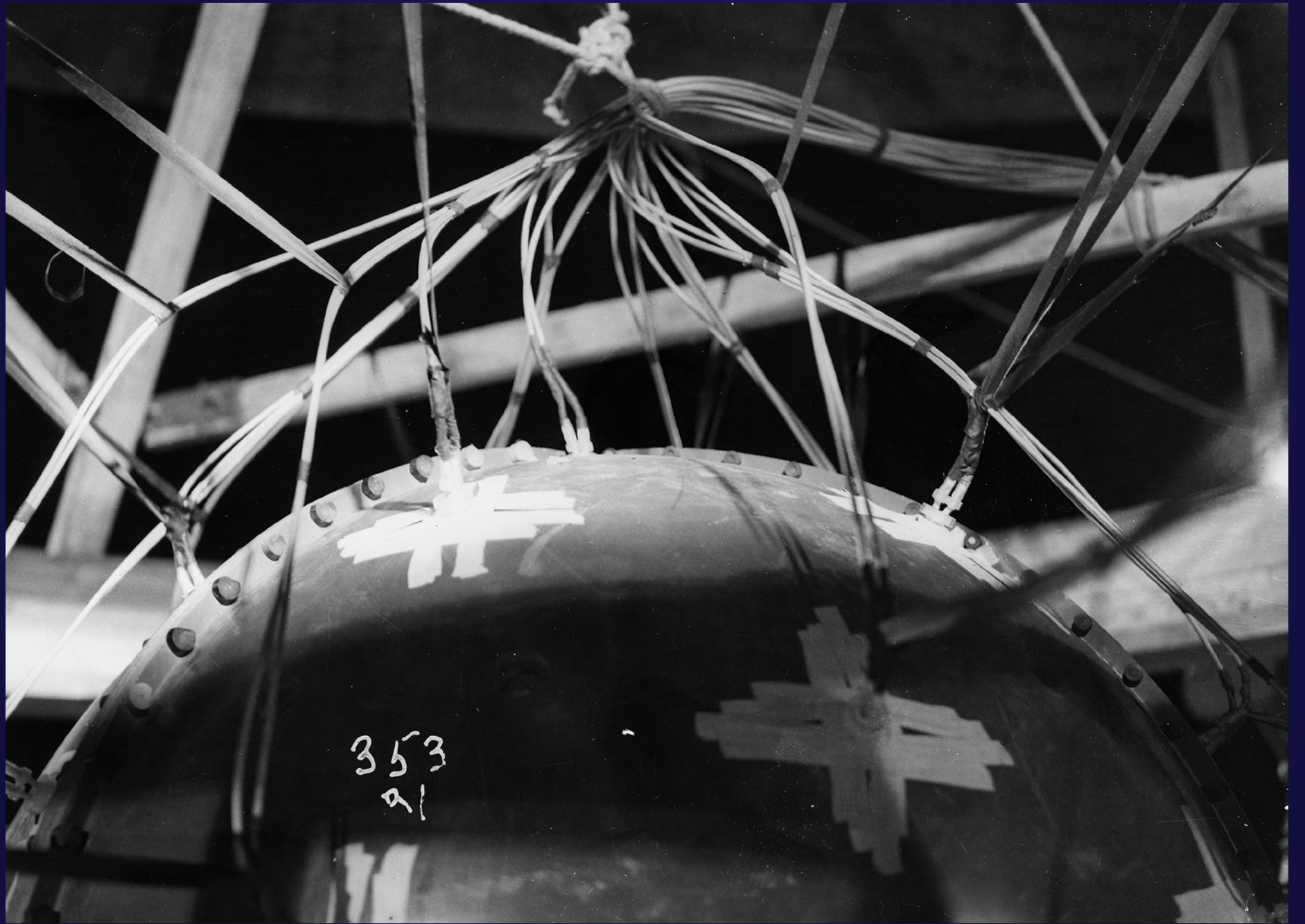
# Plastic-bonded Explosives (PBX)

# IMPLOSION





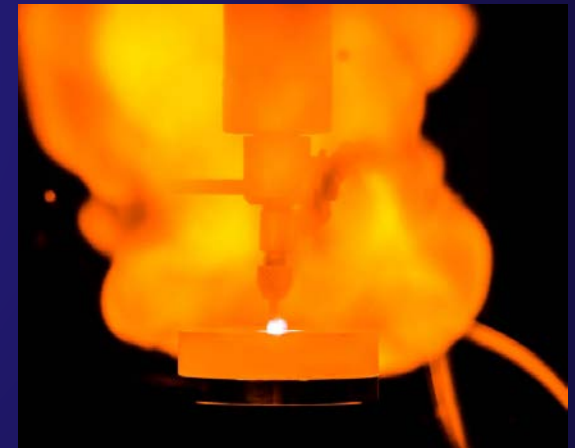
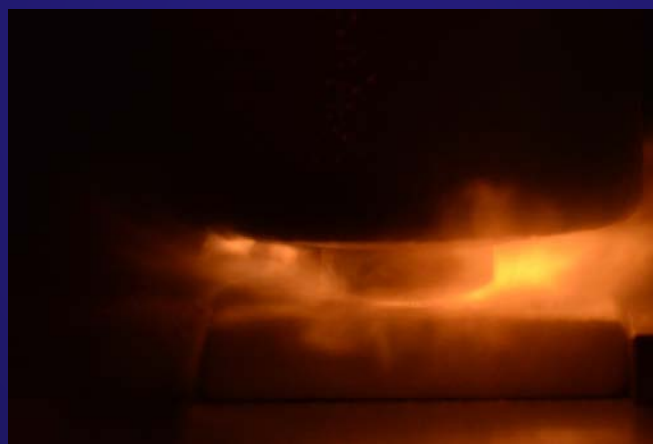
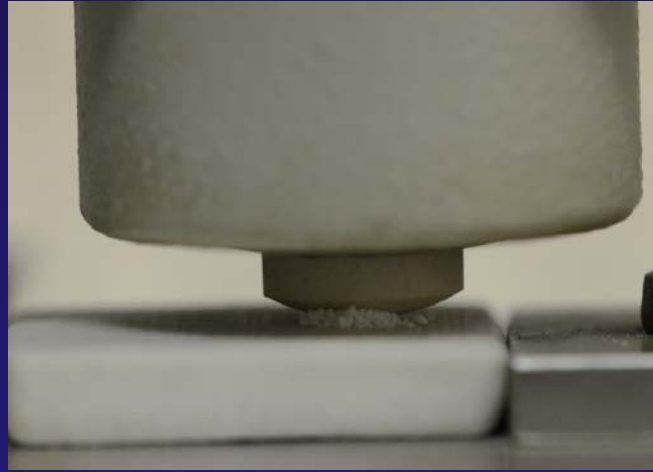












**Can an explosion happen by accident?**