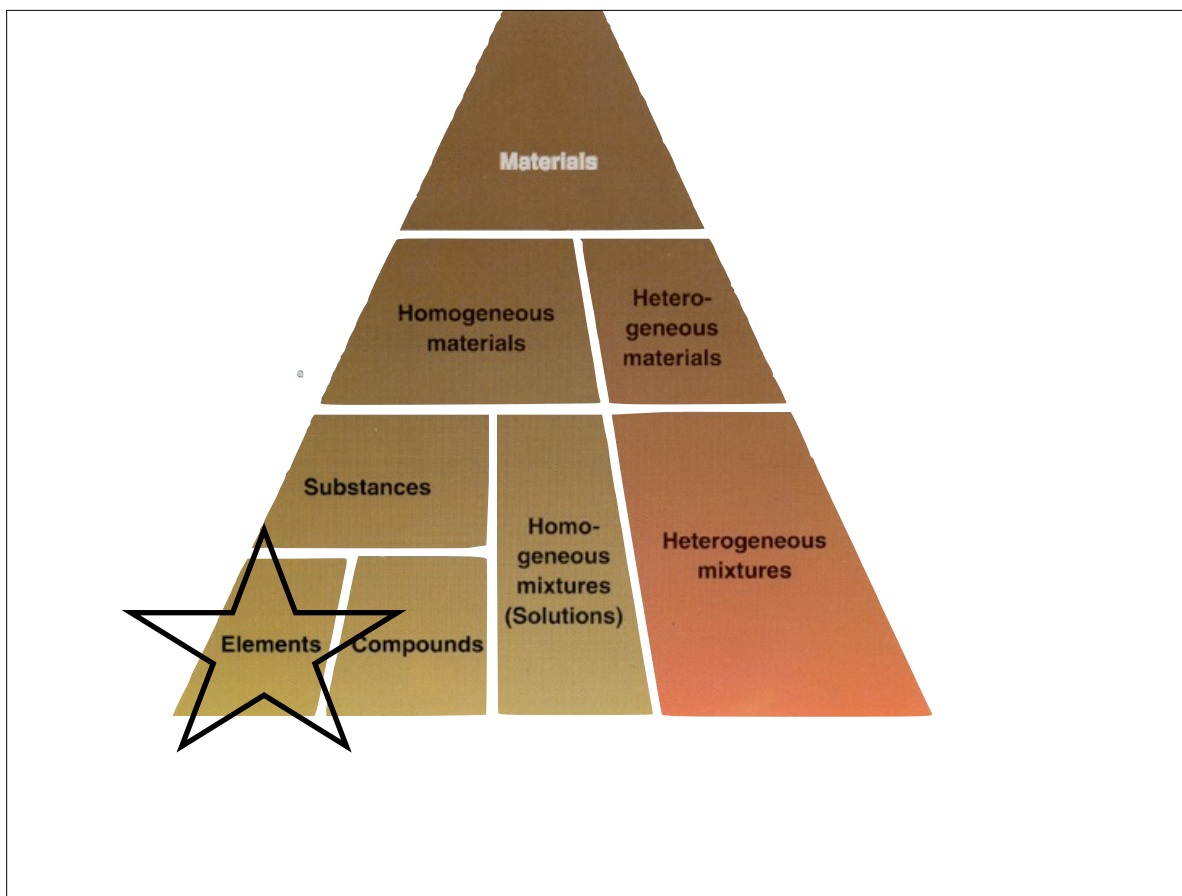


Subatomic Particles & Atomic Structure

1



2

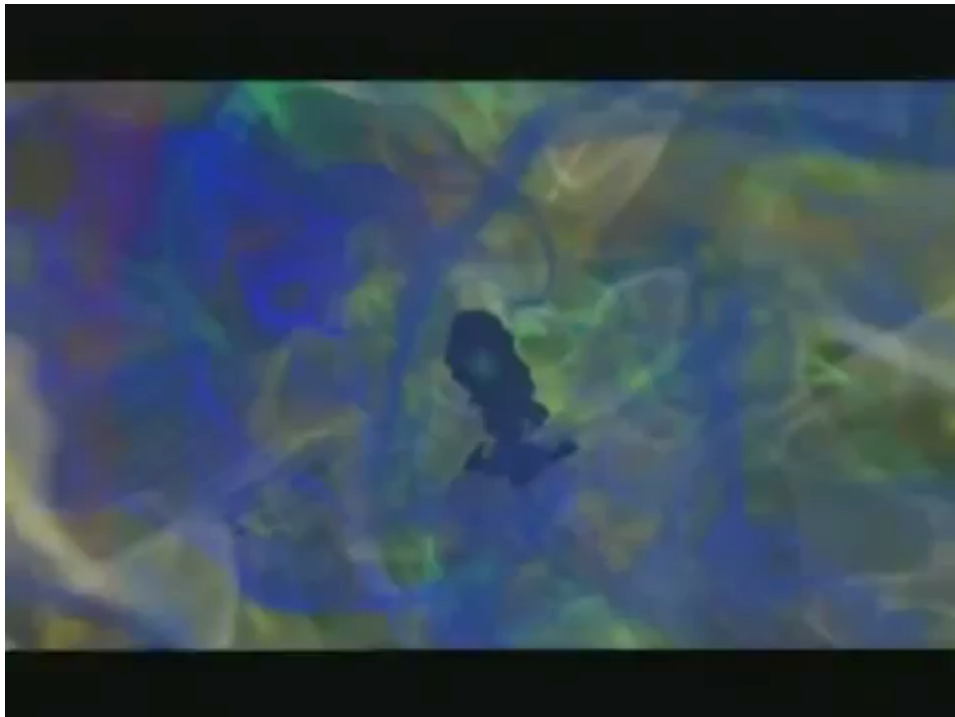
Subatomic Particles & Atomic Structure

Atomic Evolution Summary

- Where did all of the hydrogen in the universe come from?
- Simply put, what are stars?
- What is the heaviest element stars can produce?
- Where to elements heavier than iron come from?
- What is the heaviest naturally occurring element?

3

Where Do Atoms Come From?



4

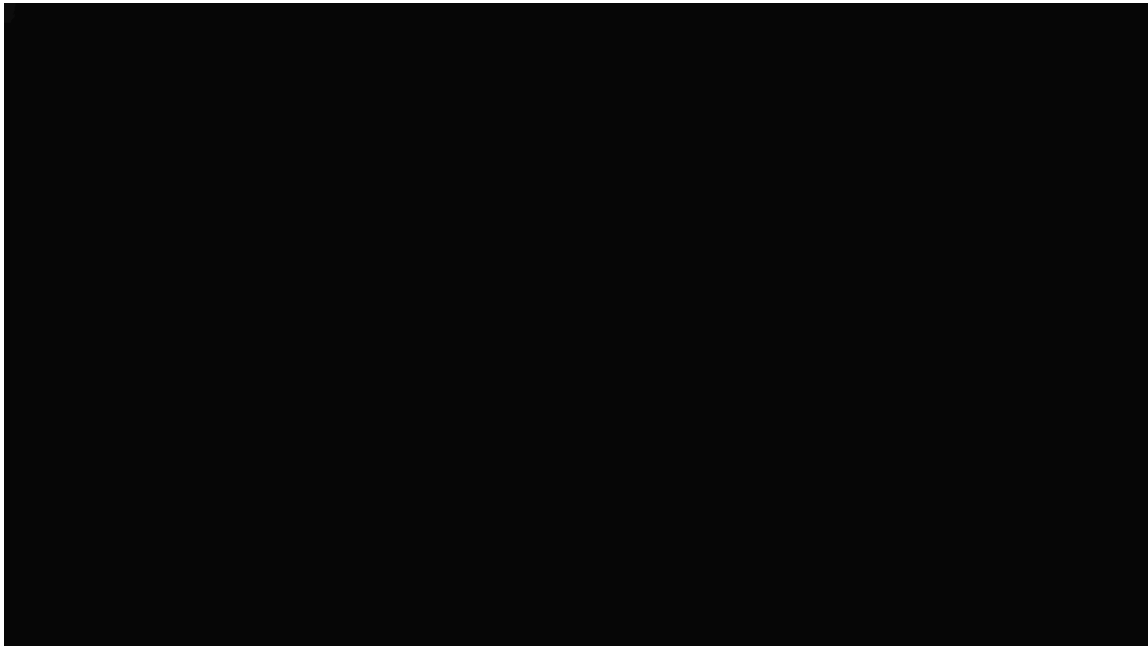
Subatomic Particles & Atomic Structure

Atomic Evolution Summary

- Where did all of the hydrogen in the universe come from?
 - The Big Bang
- Simply put, what are stars?
 - Large balls of hydrogen...fusing together hydrogen to make helium and other heavier elements
- What is the heaviest element stars can produce?
 - Iron
- Where to elements heavier than iron come from?
 - Supernova created as stars collapse during their death
- What is the heaviest naturally occurring element?
 - Uranium

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Just How Small Are Atoms?



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Subatomic Particles & Atomic Structure

Subatomic Particles

0.00000000000000000000000000167g

<u>particle</u>	<u>abr</u>	<u>mass</u>		<u>charge</u>
		<u>grams</u>	<u>amu</u>	
Proton	P ⁺	1.67 x 10 ⁻²⁴	1	+1
Neutron	N ⁰	1.67 x 10 ⁻²⁴	1	0
Electron	e ⁻	9.11 x 10 ⁻²⁸	0	-1

NUCLEONS
Carry Mass
Carry Charge

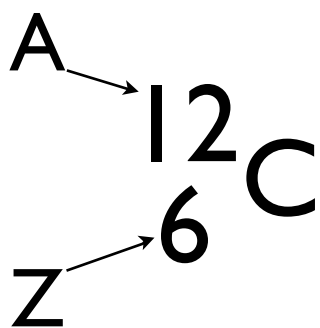
- All atoms are electrically neutral
 - Therefore, protons equal electrons

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Subatomic Particles & Atomic Structure

Atomic Number and Atomic Mass

- Atomic Number (Z)
 - Protons in the nucleus
- Atomic Mass (A)
 - Protons and neutrons in the nucleus
- Represented 2 ways....



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Subatomic Particles & Atomic Structure

Atomic Composition

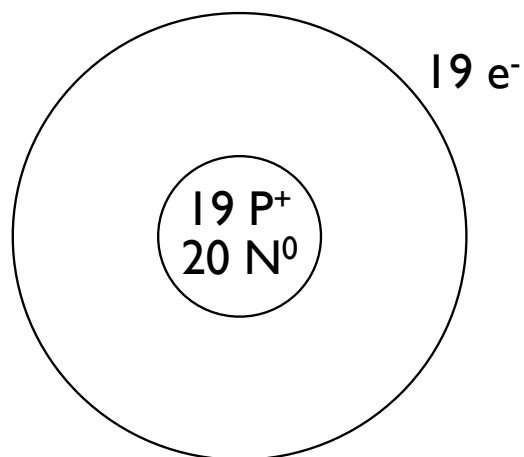
- How many protons are in an atom?
 - Z
- How many electrons are in an atom?
 - Z ...this balances charge
- How many neutrons are in an atom?
 - $A - Z = \# \text{ Neutrons}$

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Subatomic Particles & Atomic Structure

Building Atoms

Potassium



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Subatomic Particles & Atomic Structure

Subatomic Particles

Substance	Symbol	Atomic Number (Z)	Atomic Mass (A)	Protons	Neutrons	Electrons
Helium	He	2	4			
		12			12	
Zinc		30	65			
Bromine	Br		80			35
				13	14	
Uranium	U				146	92