

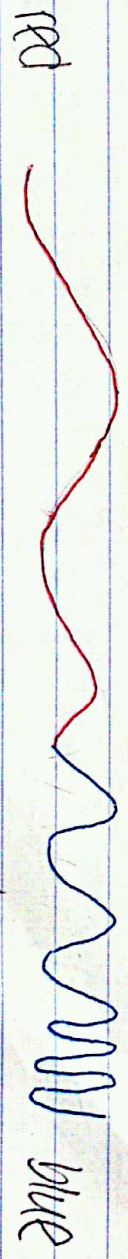
The Doppler Shift

Study Notes

Karis Tai & Evan Ma

The Doppler Shift causes the wavelengths of light coming from stars and galaxies to be either compressed or stretched. When a star is moving toward Earth, its wave lengths of light are compressed. This causes the lines to move toward the blue-violet side of the spectrum. A red shift in the spectrum occurs when a star is moving away from Earth. The Doppler Shift also applies to sound waves.

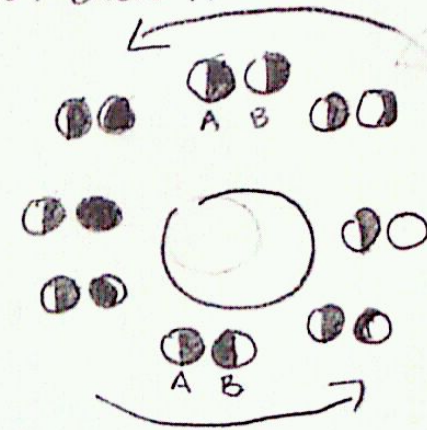
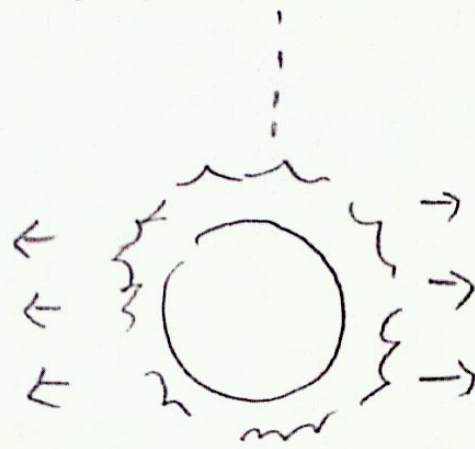
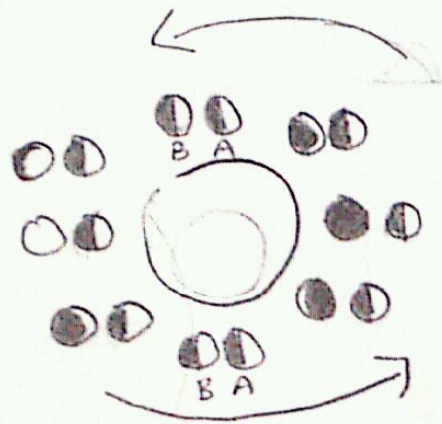
Red... waves are stretched, while blue waves are compressed. When talking about sound, blue waves are high-pitched and... red waves are low-pitched. A red shift occurs from all known stars beyond the local group, which supports the Big Bang Theory. The Big Bang theory states that everything continues to spread away from us, which is what the red shift shows.



MOON PHASES

Cindy Chang &
Partner: Annie Liu

*Not drawn to scale



Patterns

o The moon always rotates counter clockwise around the Earth

o The dark/light side of the moon always comes from the right side



waning



waning

TIP

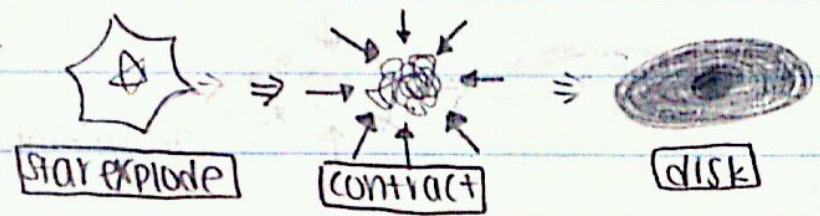
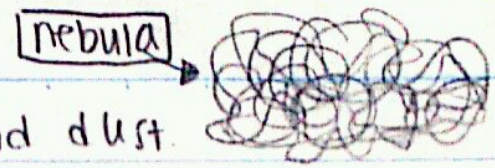
o When looking at the diagram, always start with the new moon - then going counter clockwise, it'll gradually start waxing!

* A = Shows which half of the moon would be unseen and which would be seen
* B = The phase that we see

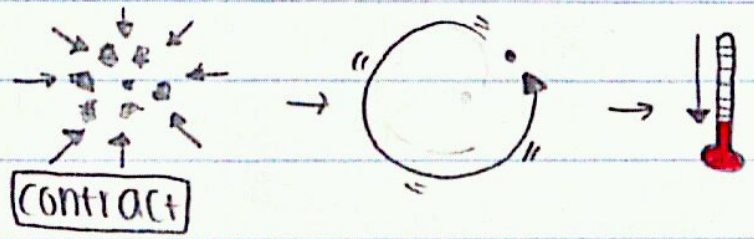
JANE PARK
Michelle Chen Sci8C

The Formation of SOLAR SYSTEM ...

- 1. 4.6 Billion years ago, there was a nebula of gas, ice, and dust.
- 2. Nearby star exploded → shock wave → cause cloud to start contracting → nebula contract to smaller pieces → density ↑ greater → pull more gas & dust toward several centers of contraction → disk

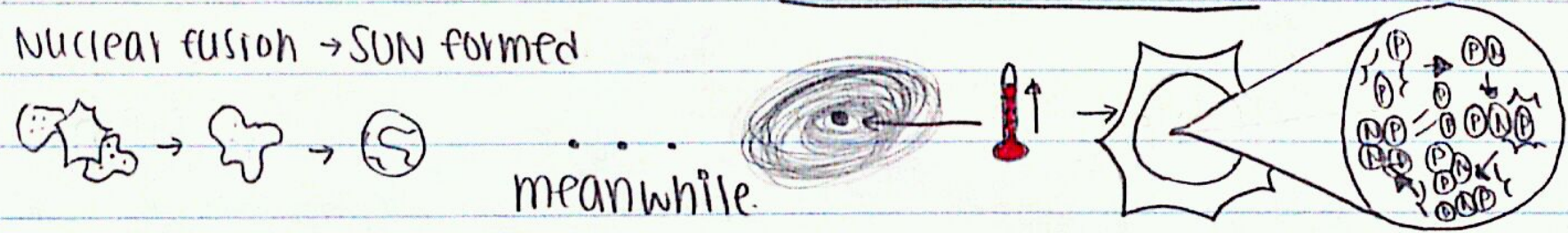


- 3. fragments contract more → rotate faster → materials on disk cool (scattered solids)



Reference: #3

- 4. clumps collide → combined → 8 planets As cloud fragments contracted, core temperature over ↑ up → Nuclear fusion → SUN FORMED



meanwhile.

Galaxies, Local Group, Universe

■ UNIVERSE

def: the space that contains all known matter and energy.

■ Local Group

def: Name of a cluster.

- Milky Way belongs in the Local Group.

■ Galaxies

- Spiral

- have spiral arms that wind outwards from the center.
- Normal - arms start close to center of the galaxy.
- Barred - arms extending from a large bar of stars and gas that pass through center of galaxy.

■ The Milky Way Galaxy

- The galaxy we are in.

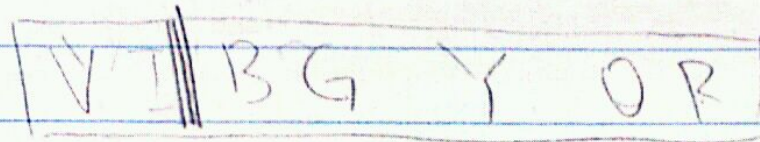
- spiral

- around 1 trillion stars and about 100,000 light years across.

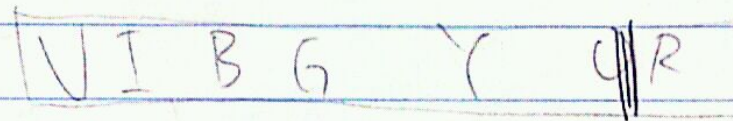
- Disk hole in the center.

Spectra Notes

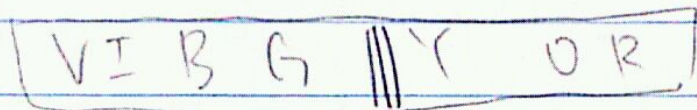
You can tell the motion of stars by observing the spectrum



This is showing blueshift. Since the object is moving towards it, the wavelength would be compressed

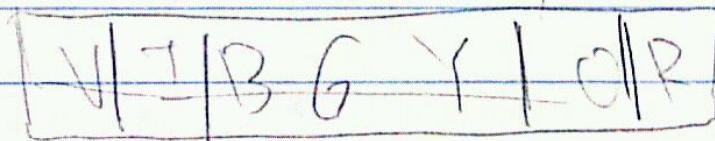


This is showing red shift, since the object is moving AWAY it, the wavelength would be elongated



← This is assuming if the object did not move at all

You can also tell the composition of the star through the spectrum



The dark lines are caused by elements in the star's atmosphere. Since elements in the atmosphere absorb some of this light, the wavelengths of visible light that are absorbed appear as dark lines in the spectrum

The elements from the light emitted from the star absorb colors from the spectrum. We can tell the elements from the star's atmosphere by observing what color does the element absorb.

Nuclear Fusion Notes

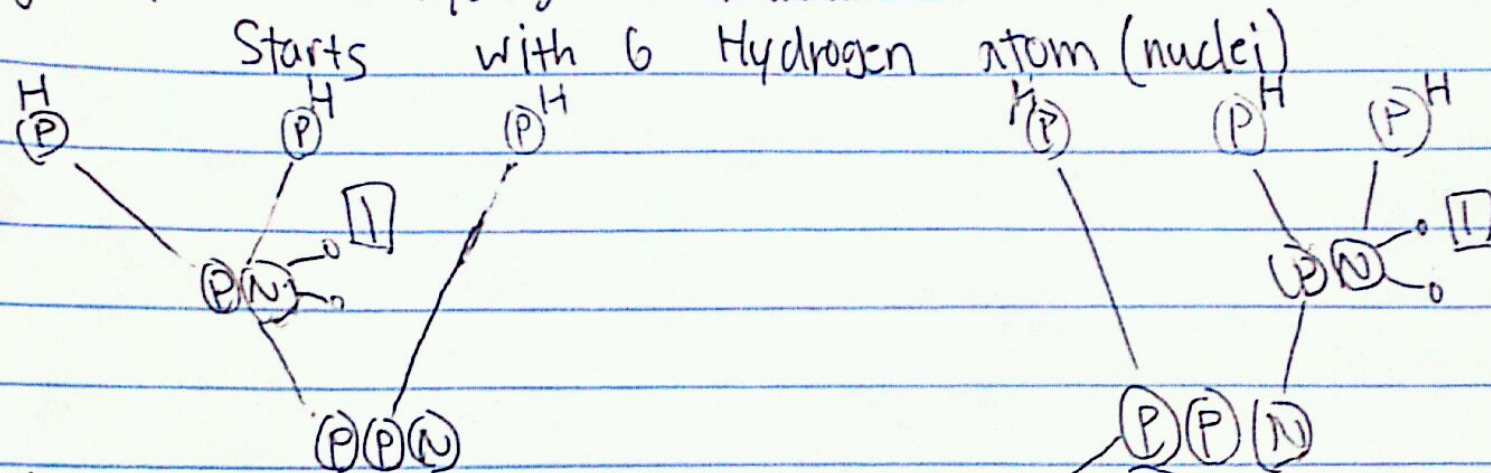
Vincent, Angela 8C

- Based on $E = mc^2$ REMEMBER

This makes mass changeable to energy and vice versa.

- Occurs in cores of stars where it is very hot (15 million K) this cause atoms to speed up and crash into each other.

- Also used to fuse heavier elements. Eg Carbon from Helium, instead of just fusion of hydrogen to helium



1 Energy is released as proton loses electrical charge

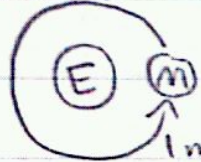
2 Energy is released as proton vaporizes for energy.

Causes

- Revolution - when an object goes around another larger object
- Earth takes 1 year to revolve around the Sun
- Extra: Moon takes 1 month to revolve around Earth

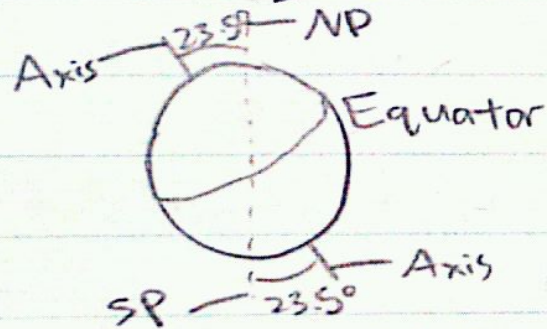


around Earth

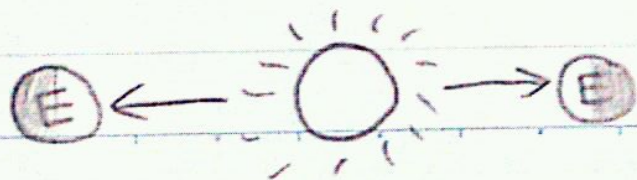


- Tilt on Axis

- Earth tilts 23.5° off its axis

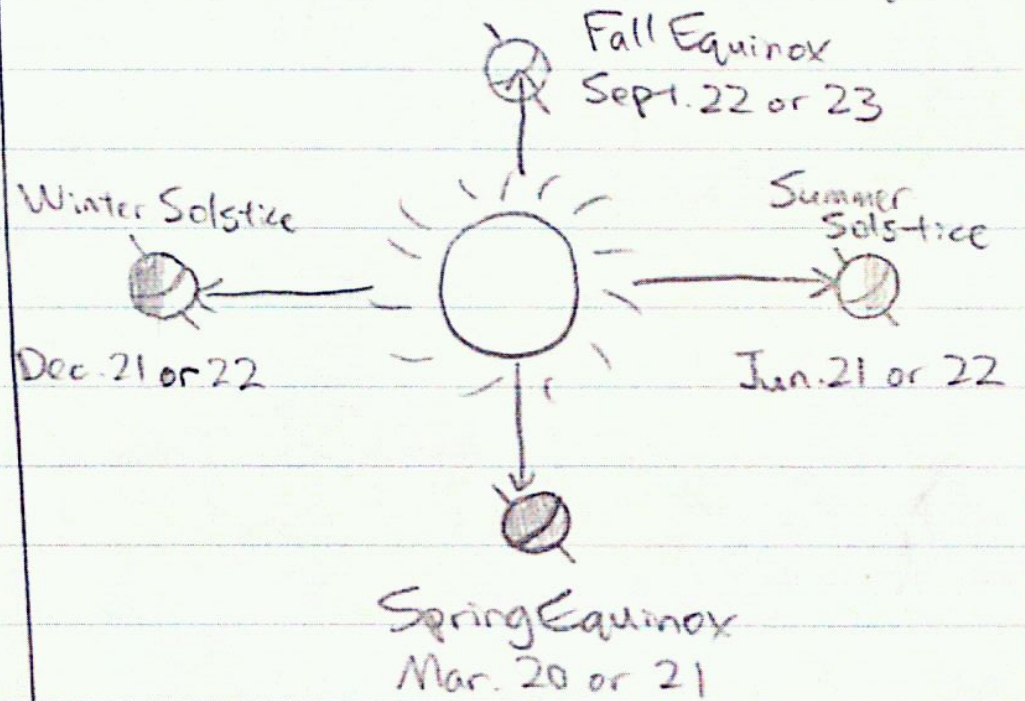


- Direct Radiation - light struck



Effects

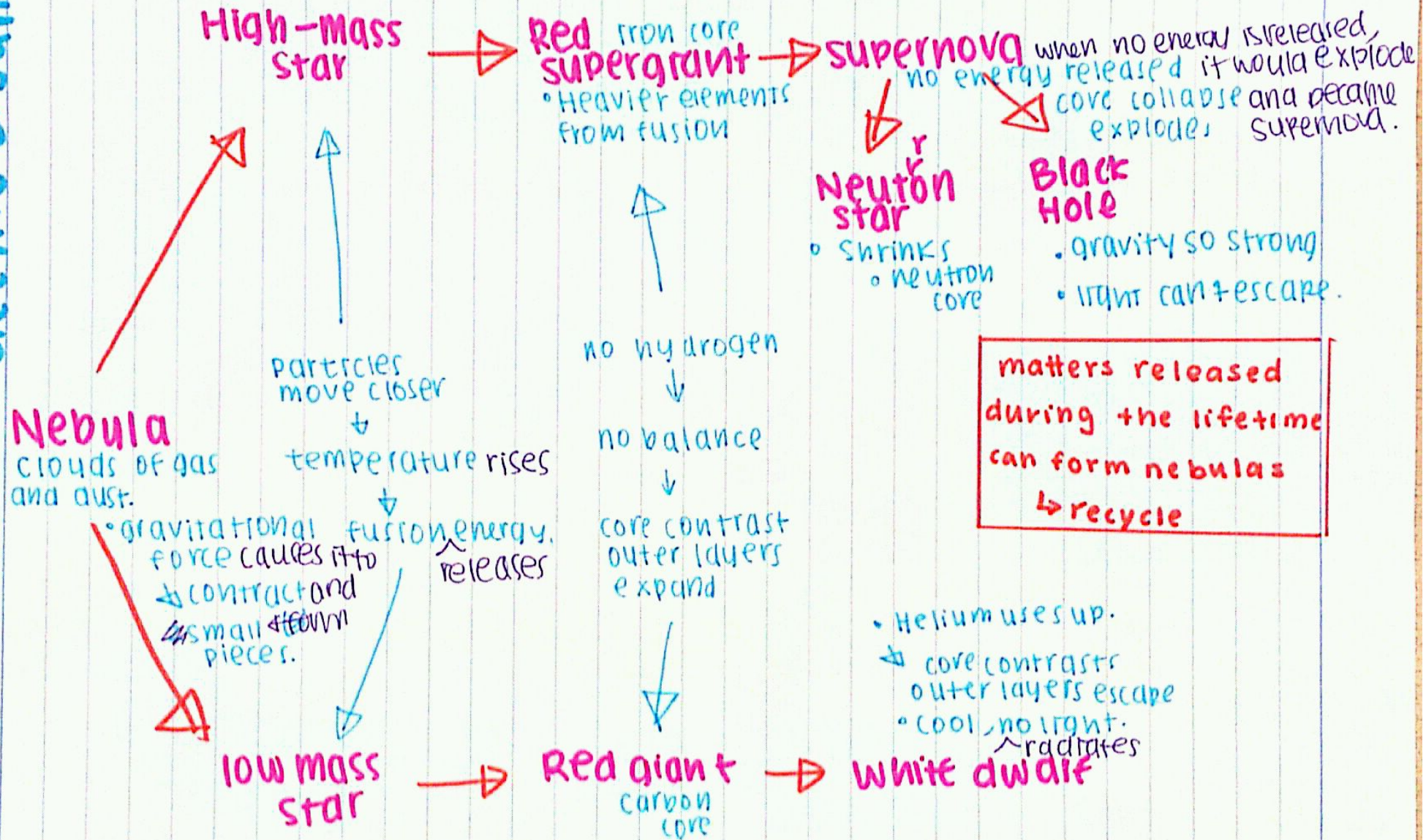
- 4 Seasons (Spring, Summer, Fall, Winter)
- Equinox - Sun is directly above equator
- Solstice - Sun reaches greatest distance north/south of equator



Anthony Yu, Brandon Lee & C

Life cycle of STARS

- Greenie & Jane C



Eclipses

Aurelne & Gordon 8C

5 types of Eclipses:

1. Total Solar Eclipse: Sun→Moon→Earth, Earth is hit by Moon's umbra
2. Annular Solar Eclipse: Sun→Moon→Earth, Earth is hit by Moon's antumbra
3. Total Lunar Eclipse: Sun→Earth→Moon, Moon in Earth's umbra
4. Partial Lunar Eclipse: Sun→Earth→Moon, Moon is halfway in Earth's umbra and Penumbra
5. Penumbral Lunar Eclipse: Sun→Earth→Moon, Moon is in Earth's penumbra

Solar: New Moon Lunar: Full Moon

Solar: Rare & Short time Lunar: More often and longer time

Notes

- photosphere : - is called the surface of the Sun
 - 6000 K
 - light is given off
- chromosphere : - 2000 km above photosphere
- corona : - largest layer of the sun's atmosphere
 - extends millions of km into space
 - 2 million K
 - charged particles escape from corona and move through space as solar wind
- sunspots : - dark areas on sun that appeared because of lower temperature
 - are permanent
 - related to several other sun features
- prominences : - huge, arching columns of gas
 - blast materials into space at speed of 600 km/s to 1000 km/s
- solar flares : - violent eruptions shot upwards suddenly ; near sun spots
- CMEs : - coronal mass ejections
 - electrically-charged particles ejected suddenly from the corona
 - could damage satellites
 - ionize gases in Earth's atmosphere, producing Northern lights