

Review Exam 4

Ch 11

Vocabulary

Galilean Moons

Differential Rotation

Flattening

Great Red Spot

Zones

Belts

Zonal Flow

Photochemical Effects

Io Plasma Torus

- ÿ Know that Jupiter is the 3rd brightest object in the night sky
- ÿ Know that Jupiter has the most moons (60+)
- ÿ Know the 4 largest moons are called the Galilean Moons
- ÿ Know that the cloud bands move in alternating directions
- ÿ Know how Jupiter's mass compares to ours
- ÿ Know that Jupiter is 2 times more massive than all of the other planets combined
- ÿ Understand that gravitationally the Sun and Jupiter are the most important objects in the solar system
- ÿ Know that Jupiter is about 11.2 times the Earth's size
- ÿ Know the density of Jupiter
- ÿ Understand that Jupiter rotates at different rates the farther you go from the equator (differential rotation)
- ÿ Know how we calculated the rotation rate of Jupiter
- ÿ Know that Jupiter has the shortest rotational period of all the planets
- ÿ Understand that Jupiter is flattened at the poles due to the rotation rate
- ÿ Know that Jupiter has a rocky core about 5 – 10 times the mass of the Earth
- ÿ Know that the major disturbance in the atmosphere on Jupiter is called the Great Red Spot
- ÿ Know how big the Great Red Spot is and how long we have known about it
- ÿ Know the main components of Jupiter's atmosphere
- ÿ Know what the zones and bands are and what drives them
- ÿ Know what the zonal flow is
- ÿ Know why Jupiter has no seasons
- ÿ Know why Jupiter has different colored bands on it
- ÿ Understand how the photochemical effect works on Jupiter
- ÿ Know the 3 main layers of Jupiter's atmosphere
- ÿ Know what spacecraft dropped a probe into Jupiter
- ÿ Know that the Great Red Spot is a hurricane like storm on Jupiter
- ÿ Know where the Great Red Spot lies and how it rotates
- ÿ Know that Jupiter releases about 2 times more energy than it receives from the Sun
- ÿ Know what is going on for Jupiter to release all of this energy
- ÿ Know what is produced in Jupiter to form the large magnetic field
- ÿ Know what the pressure at the core of Jupiter is
- ÿ Know that Jupiter's magnetosphere has captured many charged particles so you have high levels of radiation
- ÿ Know that Jupiter has aurora
- ÿ Know how the 8 moons just beyond the Galilean Moons formed
- ÿ Know what makes Io so spectacular

- ÿ Know what causes the colors on Io
- ÿ Know how the charged particles from Io's volcanoes affects Jupiter's magnetosphere
- ÿ Understand what the Io plasma torus
- ÿ Understand what drives the volcanoes on Io
- ÿ Know how old Io's surface is
- ÿ Know what makes Europa so important
- ÿ Know how old the surface of Europa is
- ÿ Know that Europa has a small magnetic field and why
- ÿ Know why Europa would have liquid water
- ÿ Know how old Ganymede's surface is
- ÿ Know that Ganymede is the largest moon in the solar system
- ÿ Understand that some type of tectonic activity may have occurred on Ganymede
- ÿ Know that Ganymede has a weak magnetic field and why
- ÿ Know how old the surface of Callisto is
- ÿ Know why no plate tectonics occurred on Callisto
- ÿ Understand that Callisto did not differentiate
- ÿ Know that Jupiter has rings and what has caused them

Ch 12

Vocabulary

Tidal Stability Limit

Roche Limit

Ringlets

Spiral Density Wave

Orbital Resonances

Wispy Streaks

Co-orbital Satellites

Lagrangian Point

Chaotic Rotation

- ÿ Know that Saturn is 9.5 AU from the Sun and takes 29.4 years to orbit
- ÿ Know that it is the second largest planet
- ÿ Know why it's density is so unique
- ÿ Know that it is composed of hydrogen and helium
- ÿ Know what the rotation rate is for Saturn and that the planet is flattened
- ÿ Know how big the rocky core is for Saturn
- ÿ Know where the rings are found around Saturn
- ÿ Understand why Saturn is so much less colorful than Jupiter
- ÿ Know what gases make up the majority of Saturn
- ÿ Know why Saturn seems to have only half as much helium as Jupiter
- ÿ Know that Saturn has a similar atmosphere to Jupiter only cooler
- ÿ Know why the atmosphere is cooler
- ÿ Know where the haze layer is and why it formed
- ÿ Know that Saturn has oval storms and turbulent patterns just like Jupiter
- ÿ Know what causes the storms and patterns
- ÿ Know how the equatorial winds on Saturn compare to Jupiter
- ÿ Know how the liquid metallic hydrogen in Saturn compares with Jupiter's and why
- ÿ Know how much energy Saturn radiates and what causes it
- ÿ Know that Saturn has a strong magnetic field
- ÿ Know that the magnetic field doesn't line up with the axis of rotation
- ÿ Know that Saturn's magnetic field is just like Jupiter's, the polarity is reversed

- ÿ Know that Saturn emits radio waves in the AM range
- ÿ Know that it was the mid 1650's that the rings were "discovered"
- ÿ Know that Giovanni Cassini discovered a dark band in the rings that is now called the Cassini division
- ÿ Know the 3 rings seen from Earth and which is the brightest
- ÿ Know what the rings are made up of and their general sizes
- ÿ Know how thin the rings really are
- ÿ Know why the rings are in a circular orbit
- ÿ Know why we have rings
- ÿ Understand what the Roche limit is and how it helps form the rings
- ÿ Know that Voyager discovered that the rings were really thousands of ringlets
- ÿ Know that there is about 20 gaps in the rings and what causes them
- ÿ Know what causes the Cassini division and which moon causes it
- ÿ Why is the F ring so special
- ÿ Know that the rings are thought to be quite young and what probably caused them
- ÿ Know that most of the moons of Saturn are covered in ice
- ÿ Know the 3 basic groups of moons of Saturn
- ÿ Know that the moon Titan has an atmosphere about 1.5 times as thick as our own
- ÿ Know what the main components are for the atmosphere of Titan
- ÿ Know that there is a layer of haze that blocks our view of the moon
- ÿ Know that the temperature on Titan means that you may have lakes of liquid methane on the surface
- ÿ Know that on Rhea the ice is so hard that it acts like rock and that is why the craters look like craters on our Moon
- ÿ Know that Rhea has wispy streaks thought to be caused by liquid water released from the interior
- ÿ Know why makes Enceladus so reflective
- ÿ Know that Enceladus shows some evidence for volcanoes and why that is unique
- ÿ Know what makes Janus and Epimetheus so unique
- ÿ Know what makes Tethys and Calypso unique
- ÿ Understand where the Lagrangian point is
- ÿ Understand what forces are at play for poor Hyperion to make it's orbit so messed up

Ch 13

Vocabulary

Radiation Darkening

Stellar Occultation

- ÿ Know what the first planet was to be discovered beyond Saturn
- ÿ Know how Neptune was theorized calculated and searched for
- ÿ Know who was given credit for the discovery of Neptune
- ÿ Know that Neptune lies 30.1 AU from the Sun and takes 163.7 years to go around the Sun
- ÿ Know how Uranus and Neptune compare to eth Earth in size and mass
- ÿ Know the densities of Uranus and Neptune and their rotation rates
- ÿ Know what is so bizarre about Uranus' axial tilt and what is thought ot have caused it

- ÿ Know how the rotation rate of the clouds and the magnetic field of Neptune compare and why that is unique
- ÿ Know what the main components of the atmosphere for both worlds are
- ÿ Know why there is no ammonia gas found on Uranus and Neptune
- ÿ Know that there doesn't appear to be any weather on Uranus and why
- ÿ Know that Neptune shows all kinds of clouds and disturbances in its atmosphere
- ÿ Know what the Great Dark Spot is and where it was found
- ÿ Know how fast the winds of Neptune are
- ÿ Know that both Uranus and Neptune have strong internal magnetic fields that are tilted to the axis of rotation and offset from the center of each world
- ÿ Know that Uranus and Neptune have rocky cores
- ÿ Know that there is no liquid metallic hydrogen and why
- ÿ Know that we only knew about 5 moons of Uranus from the Earth and now we know about 27
- ÿ Know that most of the small moons orbit retrograde in highly inclined orbits
- ÿ Know that Titania and Oberon are heavily cratered and show little geologic activity
- ÿ Know that they are very dark and why
- ÿ Know that the surface features of Miranda is very exciting with all kinds of different forms and what may have caused it
- ÿ Know that the largest moon of Neptune is Triton
- ÿ Know that Triton orbits retrograde in an orbit that is tilted 20°
- ÿ Know that Nereid is small and is a very elongated orbit (1.4 – 9.7 million km)
- ÿ Know that Triton is the 6th largest moon in the solar system and it has a thin nitrogen atmosphere
- ÿ Know that Triton has very few craters
- ÿ Know what may have caused the water ice lakes on Triton
- ÿ Know that Triton is the coldest moon in the solar system
- ÿ Know that there are great jets of nitrogen spewing forth from Triton
- ÿ Know that Triton is thought to be a captured object
- ÿ Understand how the rings of Uranus were discovered
- ÿ Know that Uranus' rings are dark, narrow and widely spaced
- ÿ Know that there are shepherd moons helping keep the rings in shape
- ÿ Know that Neptune has 5 thin rings all within the Roche limit
- ÿ Know that the rings of the Jovian worlds are all different but have a common method of formation
- ÿ Know where Pluto was discovered
- ÿ Know that Pluto is a very eccentric orbit which means that at perihelion it is 29.7 AU away and at aphelion it is 49.3 AU
- ÿ Know that for 20 years Pluto was inside Neptune's orbit
- ÿ Know that we calculated the physical properties of Pluto after 1978 when the moon Charon was discovered
- ÿ Know the mass of Pluto and orbital period of the moon
- ÿ Know the rotation rate of Pluto
- ÿ Know that Charon is about $\frac{1}{2}$ the size of Pluto
- ÿ Know where Pluto and Charon are thought to have come from