GEOL 1312 **Name** _____

HOMEWORK #4 – Mars, Outer Planets & Moons

Due Thursday, October 29th IN CLASS

Answers to the questions must be given in complete sentences (except where indicated), using correct grammar and spelling. Please be as brief and to-the-point as possible (*more is not necessarily better)*.

You are encouraged to explore the web for help but **DO NOT COPY DIRECTLY FROM WEBSITES.** If you obtain information from a website, please provide the reference.

Homework assignments must be legible. Handwritten or typed responses are permitted. Make sure that your assignment is stapled!

Grading Summary:

Question 1: 18 points

Question 2: 4 points

Question 3: 12 points

Question 4: 6 points

Total: 40 Points

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1. Google Mars (18pts)

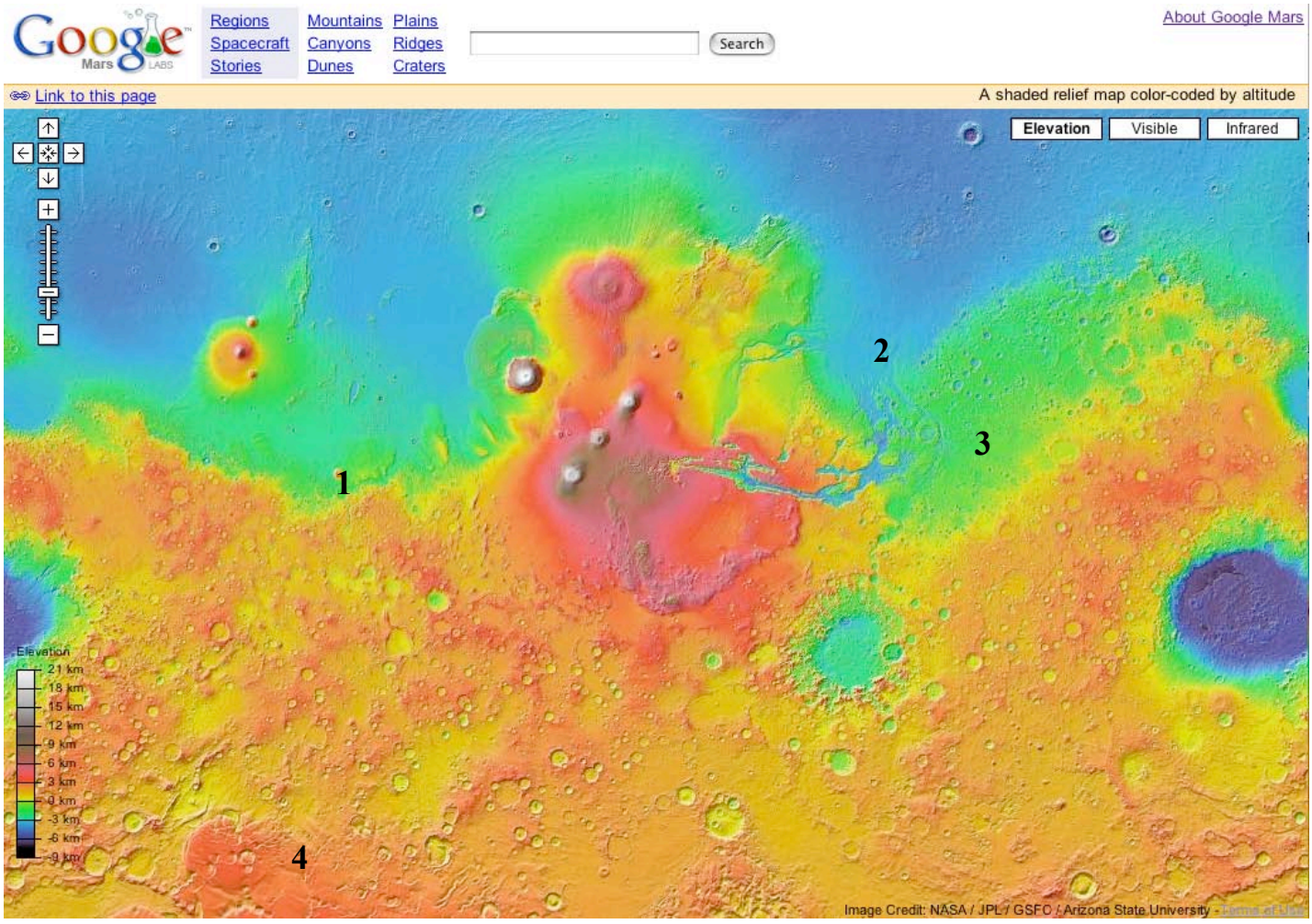
The *Google* guys recently teamed up with NASA researchers at Arizona State University to create one of the most detailed online scientific map and image archives ever made of Mars – **Google Mars**. For this question, you will explore the data and images available on Google Mars to answer the questions below.

To begin, navigate to the following website:

http://www.google.com/mars/

Note: If Internet Explorer does not properly load the page, try an alternative web browser (ie., Firefox, Safari, etc.)

After the page finishes loading, you'll see a colorful image of Mars's topography, similar to the screen snapshot below (without the numbers). Depending on the size of your computer screen, you may need to use the zoom in/out buttons on the left side of the website to view Mars in its entirety. Note that you can also slide the topography image around on your screen by simply clicking and dragging your mouse over the image.



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Click on the link at the top of the webpage (next to the Google sign) named "Spacecraft". A column on the left side of the website should appear, providing a list of Martian spacecraft. Clicking on any of these links will produce a pop-up balloon with more information about the spacecraft and mission.

A) Using the spacecraft links on Google Mars, along with the map from the previous page, match the numbered map locations (**1-4**) with the spacecraft landing sites. In the box below, also identify when each of these spacecraft were launched and how long each operated.

Map Label	Spacecraft Name	Year of Launch	Length of operation
1			
2			
3			
4			

B) Now click on the link at the top of the webpage (next to the Google sign) named "Canyons". A column on the left side of the website should appear, providing a list of Martian canyons. Clicking on any of these links will produce a pop-up balloon with more information about canyons on Mars. You can also do the same for "Mountains" and "Craters". Note that green balloons have links to online articles, while red balloons do not.

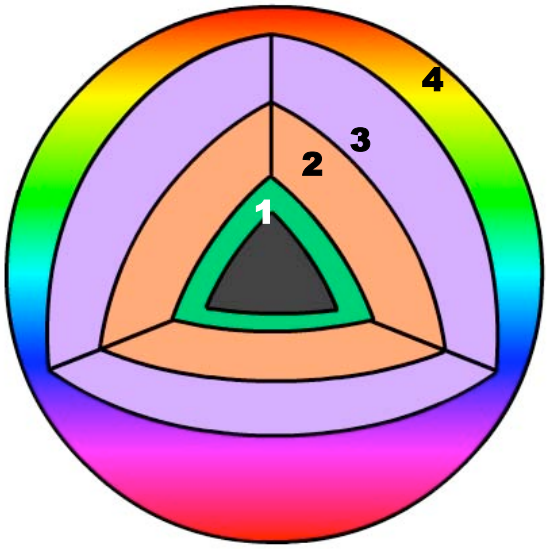
Explore the green balloon features and choose 1 Martian canyon, mountain, and crater to report below. In the description box below, provide one *brief* sentence that explains why you think the feature is interesting.

Martian Feature	Date Photo Taken	Description
Canyon		
Mountain		
Crater		

2. Mystery Gas Giant Planet (4pts)

Suppose that a fictional planet Prometheus has four layers, shown below. Also suppose that Prometheus rotates twice as fast as Earth and that it transports heat through convecting fluid motions.

Based on this information, would you expect Prometheus to have a magnetic field? If so, which of the following layers (1-4) would the magnetic field be generated and why?



Layer 1) Small rocky core
Layer 2) Ice layer
Layer 3) Liquid metallic hydrogen
Layer 4) Gas & liquid molecular hydrogen

3. Moons & Planets: Size Comparison (12pts)

Indicate the **radius** (in km) of each of the following solar system bodies and list them in order of DECREASING size: Mercury, Moon, Io, Europa, Ganymede, Callisto, Titan, Pluto

	Mercury	Moon	Io	Europa	Ganymede	Callisto	Titan	Pluto
Radius (km)								

LARGEST ⟶ SMALLEST

4: Midterm 2 Review (6 pts)

4.1) Which planet has the largest volcano? (*Do you remember the name?*)
a. Jupiter
b. Mercury
c. Venus
d. Mars
e. Earth

4.2) About how old is the Earth?
a. 500 thousand years
b. 4.6 million years
c. 500 million years
d. 4.6 billion years
e. 4.6 hundred years

4.3) The dominant constituent of the Venus atmosphere is
a. Oxygen
b. Nitrogen
c. Carbon dioxide
d. Sulfur dioxide
e. Water

4.4) Which planet(s) rotates around its axis in a retrograde direction?
a. Pluto
b. Venus
c. Uranus
d. Neptune
e. a, b, and c

4.5) How many geologists have landed on the moon?
a. 1
b. 2
c. 4
d. 6
e. 8

4.6) What is the dominant constituent(s) of the Jupiter and Saturn atmosphere?
a. Methane and ammonia
b. Water and ice
c. Hydrogen and sulfer
d. Hydrogen and helium
e. Water and ammonia