

Name _____

HOMEWORK #4 – Venus

Due Friday, May 12th 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**. Links posted on the course website may be particularly helpful in answering some of the homework questions.

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

Grading Summary:

Question 1: 30 points

Question 2: 20 points

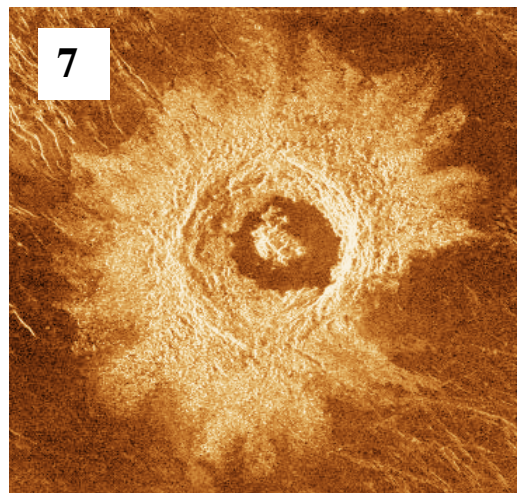
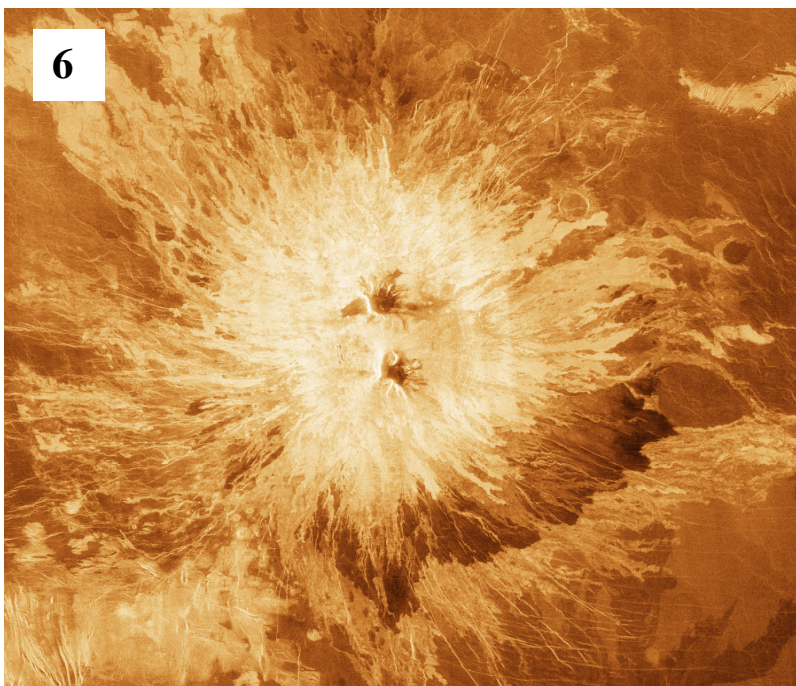
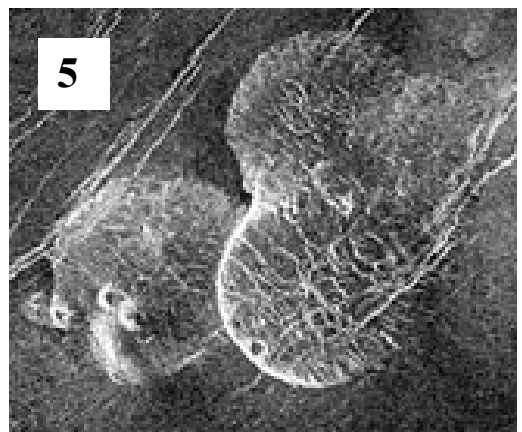
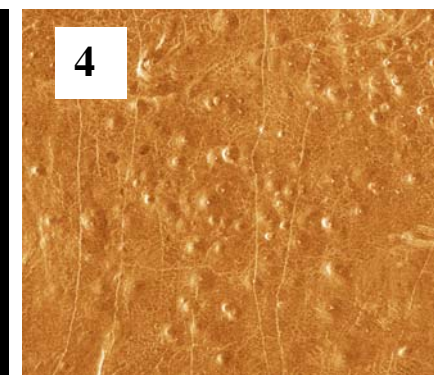
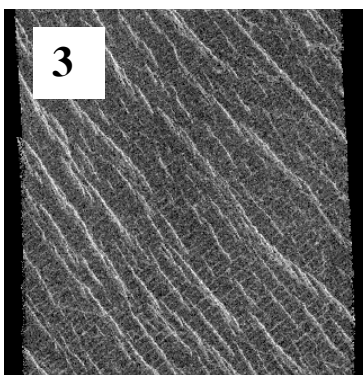
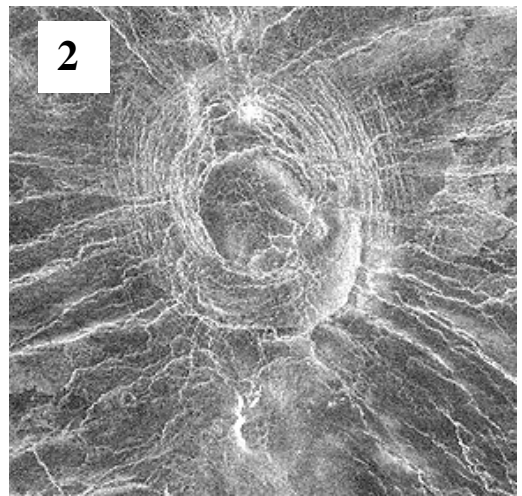
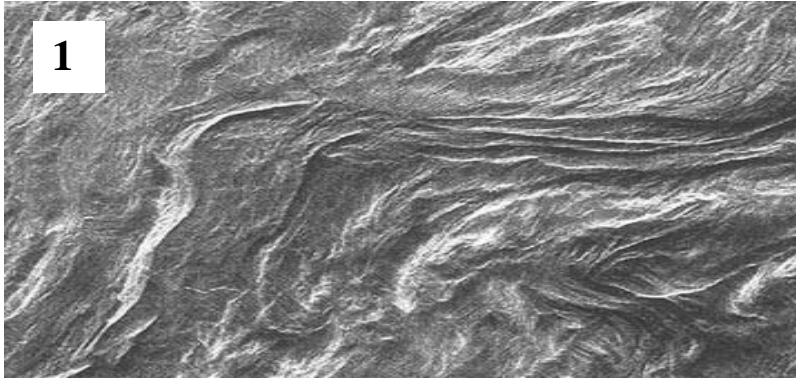
Question 3: 20 points

Question 4: 30 points

Total: 100 points

1. Venusian Surface Features

1.1) On the following page, match the images with the geological features or processes that best describe them:



Name _____

Faulting/Fractures
Pancake Domes
Coronae

Folding/Mountain Belts
Shield Fields

Impact Crater
Volcano

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

1.2) Of these seven images, which are related to volcanism on Venus?

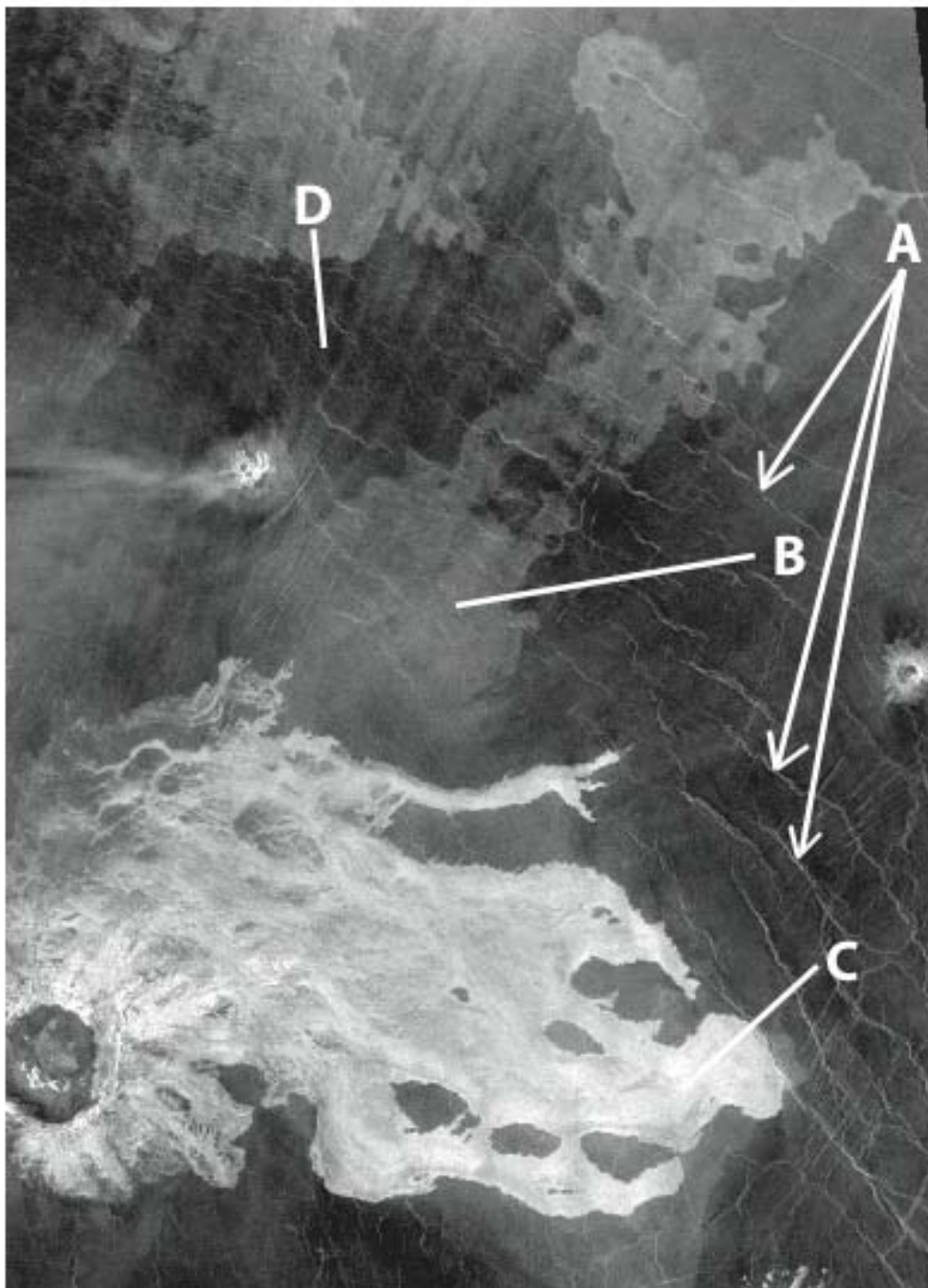
1.3) Which are related to tectonism (or tectonics) on Venus?

1.4) Which of these types of features/processes do we find on Earth?

1.5) Which of these features/processes is/are unique to Venus?

2. Geologic History on Venus

2.1) Using the table on the following page, arrange the labeled features (A-D) in the radar image below from youngest to oldest. To do this, think about both the radar image properties (why surfaces look bright or dark) and also cross-cutting and stratigraphy relationships. Note that “A” refers to the fracture lines that streak across the image. “B” refers to the gray regions, “C” refers to the bright white regions, and “D” refers to the dark regions.



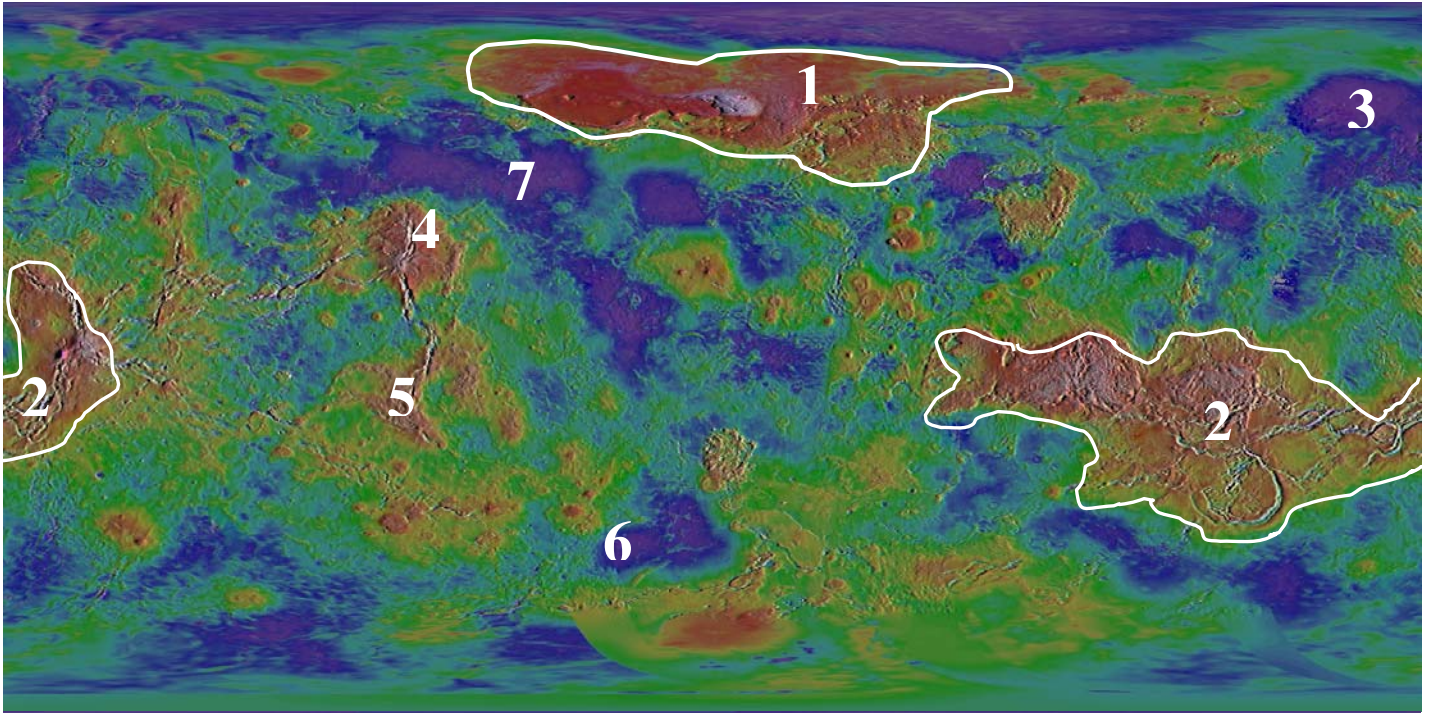
Name _____

Age	Feature	Reason
1 Youngest		
2		
3		
4 Oldest		

2.2) What kind of geologic process(es) are identifiable in this radar image? (ie., volcanism, tectonism, cratering, etc.) How do you know?

3. Venusian Geography

3.1) Using the topographic map of Venus below, identify the labeled geographic features:



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____

3.2) Of the 7 geographic regions labeled above, which contains the highest mountain on Venus?

What is the name of this mountain?

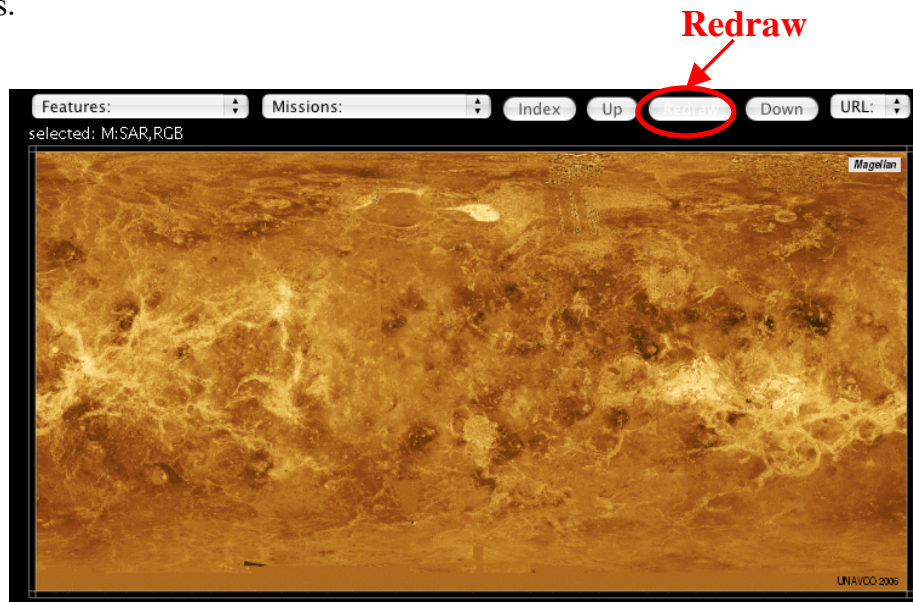
Was it formed through volcanism or compressional tectonic forces?

4) Venus Exploration

Using the internet, navigate to the following webpage:

<http://jules.unavco.org/Voyager/Venus>

You will use this website to identify geographical features on Venus and map the locations of space missions to Venus. The webpage may take a few seconds to fully load, but when it is complete, you should see something like the screen snapshot below of Venus.



You can click on the “Getting Started” link at the top of the page for general directions for navigating through the website. You may also want to take a few minutes and try out some of the interactive menu options (*Features*, *Missions*, zooming). Each time you make a change to the *Features* or *Missions* menu, you will need to click the **Redraw** button (highlighted above). If you get stuck, simply reload the website and start over.

4.1) Topography & Geography

Using the pull-down **Features** menu, select **Radius (GTDR)** and then click **Redraw**. This will produce a color-coded map of relative elevations on Venus. Compare your resulting map to the map from Question 3 (note that the two maps are centered on a different region of Venus and they are also shown in different colors).

Using the map and your answers from Question 3 as a reference, what is the name of the large elevated region on the right side of the map (on the computer), just south of the equator?

Name _____

What is the name of the elevated region in the center of the map, located in the northern region of Venus?

What is the name of the low-lying region on the right side of the map, located in the northern region of Venus?

4.2) Pioneer Venus Mission

Using the pull-down **Missions** menu, select **USA Pioneer Venus sites** and then click **Redraw**. This will plot the impact locations (*tiny* turquoise dots) of the Pioneer mission probes (you'll have to look hard for these, as they are small and don't show up well). To plot the date of impact, use the pull-down **Missions** menu and select **ancillary site data** and click **Redraw**.

According to your map, how many Pioneer probes were sent down to the surface of Venus?

On which date did this occur?

One Pioneer Venus probe landed in a northern region of Venus. Name this geographic region.

Extra info: The Pioneer Venus probes descended through the Venusian atmosphere and collected temperature and pressure data, sampled particles in the clouds, and measured the winds and atmospheric composition.

4.3) Venera Mission

Using the pull-down **Missions** menu, select **USSR Venera sites** and then click **Redraw**. This will plot the lander & probe locations (*tiny* magenta stars) of the Venera spacecraft. If you still have **ancillary site data** selected, landing dates for these should automatically appear.

According to your map, how many Venera probes & landers were sent down to the surface of Venus?

According to your map, what was the span of years that these probes & landers explored Venus? (you may want to use the zoom tool (draw a box with the mouse) to enlarge the map)

According to class notes and the book, what temperature and pressure did the Venera landers & probes record on Venus's surface?

Which Venera landers obtained photographs of the surface of Venus? (Name 2)

4.4) Magellan Mission

What part of Venus did the Magellan mission collect data?

Name three types of data that the Magellan mission collected:

- 1.
- 2.
- 3.