

## Mars for Earthlings

**LESSON 4: Remote Sensing Mars****Homework 2**

Remote Sensing\_MFE

*Mars Image Analysis*

**Directions:** View the following THEMIS image and answer the questions about the image. As you view the image, think about how this image might support one or more of NASA's main exploration goals:

1. Determine if life ever existed on Mars
2. Characterize the climate of Mars
3. Characterize the geology of Mars
4. Prepare for future human exploration of Mars

Go to: <http://themis.asu.edu/>

**Questions:**

*Getting to know THEMIS imagery (click on the "about")*

1. In a few sentences explain what THEMIS detects and how it works.
2. Go to THEMIS image: <http://themis.asu.edu/node/5765>  
What is the title of the THEMIS image?
3. Study the THEMIS image. List at least two features you observe.
  - a.
  - b.
4. If the sun is illuminating from the left, are the features expressing positive (hill) or negative (valley) relief? If features differ from another (i.e. one has positive relief and the other negative) describe their relief separately.
5. What is the Lat/Long of the center of THEMIS image?  
Lat \_\_\_\_\_ Long \_\_\_\_\_



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6. Explain how this image meets or does not meet NASA's exploration goals of Mars.
7. If you were to lead a lander mission to an area located within the image, where would you land and why?

*More THEMIS Imagery*

8. Go to the THEMIS image gallery by Topic: <http://themis.asu.edu/gallery>  
Choose an image you like and report the following:
  - a. What is the image ID or the image url that you chose?
  - b. Why did you choose this image?
  - c. Where is the image located?
  - d. Near what major Mars geographic region is it located (South/North pole, Victoria Crater, Endurance Crater, Merdiani Planum, Hellas Basin, etc.)? Use the *View this image on Map* link at the bottom of the image data column to see a map view of Mars.
  - e. Why might this location be important to science?



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### *HiRISE Imagery*

9. Navigate to the HiRISE website: <http://hirise.lpl.arizona.edu/>
  - a. Scroll to the bottom of the page (gray box) and click on the link “Science Themes”. Click on the *Aeolian Processes* file of images. Under the main image click “View Images in this Theme.” Find image titled “Dunes in the Western Nereidum Montes.” If you cannot find the image type ESP\_013046\_1390 into the search box.
  - b. Define the term *Aeolian*. (also known as eolian)
  - c. Why might an image of *aeolian* processes on Mars be of interest to us on Earth?
  - d. Sketch what you see below. Label appropriate parts (high and low areas). Can you identify the direction of the wind if North on Mars is up? If so, what direction (cardinal direction) is it?

