



# Space Day: Prospecting for Knowledge

## 14-Lunar Landform Identification – Teacher Page

**Purpose:** To identify landforms on the surface of the Moon using orbital, Apollo spacecraft photographs.

**Background:** Taking a good, close look at the Moon with the naked eye, through binoculars or a telescope can set the stage for a fascinating exploration of our nearest neighbor in space. Bright areas and streaks, dark areas, and circular features can be discerned easily. Photographs taken from lunar orbit give us even closer looks at the Moon's surface. The fun part is knowing what you're looking at and that's what this activity is all about.

Students will need to know the following vocabulary of landforms on the Moon:

**Highlands** - bright, extensively cratered areas of igneous rocks rich in the mineral plagioclase and breccias (rocks actually made of broken pieces of many rocks smashed back together again).

**Maria** - dark areas covered by lavas of the volcanic rock type called basalt.

**Impact crater** - roughly circular hole created when something struck the surface.

**Terraced crater walls** - steep walls of an impact crater with stair steps created by slumping due to gravity and landslides.

**Central crater uplift** - mountain in the center of large (>40 kilometer diameter) impact craters.

**Crater ejecta** - material thrown out from and deposited around an impact crater.

**Ray** - bright streak of material blasted out from an impact crater.

**Multi-ringed basin** - huge impact crater surrounded by circular mountain chains.

**Lava flow** - a break out of magma from underground onto the surface.

**Rille** - channel in lunar maria formed as an open lava channel or a collapsed lava tube.

**Wrinkle ridge** - long, narrow, wrinkly, hilly section in maria.

**Cinder Cone** - low, broad, dark, cone-shaped hill formed by explosive volcanic eruption.

**Dome** - low, circular, rounded hill suspected to be a volcanic landform.

An easy-to-understand background article "The Moon: Gateway to the Solar System," written by Dr. G. Jeffrey Taylor, is available in NASA publication EG-1997-10-116-HQ. Find it on-line at the Lunar Prospector mission education homepage or in the curriculum materials section of NASA Spacelink. An accompanying slide set (Publication ES-1997-12-002-HQ) is also available on-line from Spacelink. Use these resources and other books and pictures to show your students what's on the Moon.

Additional on-line resources for lunar images and Moon mission information:

Moon missions and photos (including 3-D images) from the Lunar and Planetary Institute, Houston, Texas.

Apollo manned space program information from the National Air and Space Museum.

Futuristic moon mission artwork and real Apollo photos from Johnson Space Center.

**This Activity:**



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This activity uses eight photographs taken by Apollo mission orbital cameras to show thirteen major landforms on the surface of the Moon (defined above.) Students match the numbers on the photographs (1 through 20) with the name of the landform. A "Lunar Landform Identification" student chart is provided to record answers.



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**Preparation:** Print out copies of the lunar photographs for this activity. Make copies of the blank "Lunar Landform Identification" student chart. Print out copies of the answer chart.

**In Class:** This activity can be used as a group or individual culminating experience for students who have been studying the Moon. The vocabulary words can be given as a separate assignment before the landform identification.

**Wrap-Up:** Compare student charts with the answer chart and discuss any discrepancies. Were some landforms easier to identify than others? Did shadows (sun angle) help make some features easier to see? Which landforms would you like to stand on?

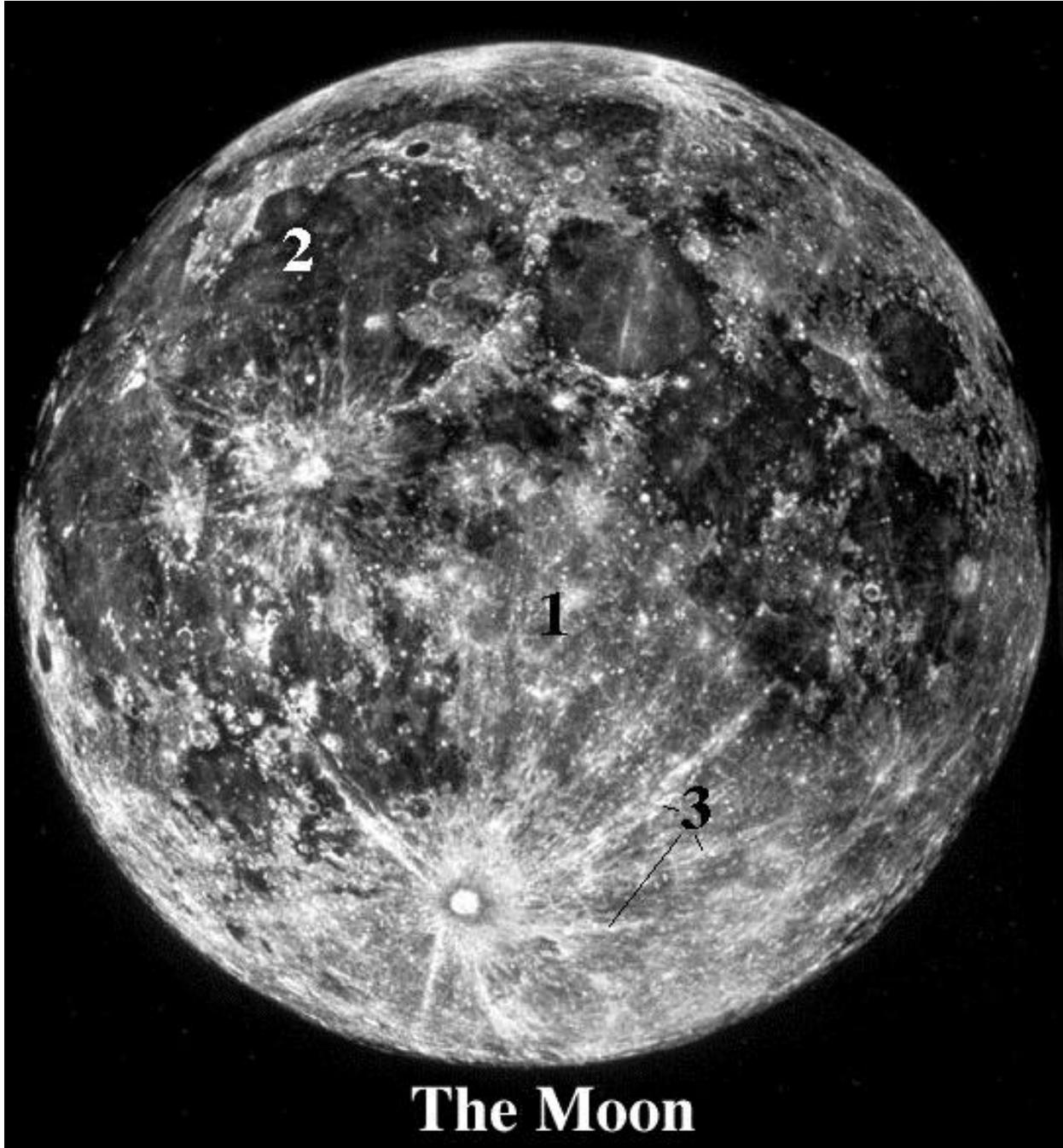
**Extensions:** Using the label on each photograph, locate the areas on a globe or map of the Moon. Determine the latitude and longitude of the area in each photograph. Use maps of the Moon to determine the size of the landforms. Find the same landforms in photographs from the Apollo landing sites. Research and discuss Moon missions past, present, and future. Use the knowledge gained from this activity in the Lunar Life Support activity.

## Lunar Landform Identification Answers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Highlands	X				X															
Maria		X				X														
Impact Crater								X	X											
Terraced Crater Walls												X							X	
Central Crater Uplift													X							X
Crater Ejecta											X									
Ray			X																	
Multi-ringed Basin				X														X		
Lava Flow														X						
Rille							X										X			
Wrinkle Ridge															X					
Cinder Cone										X										
Dome																X				



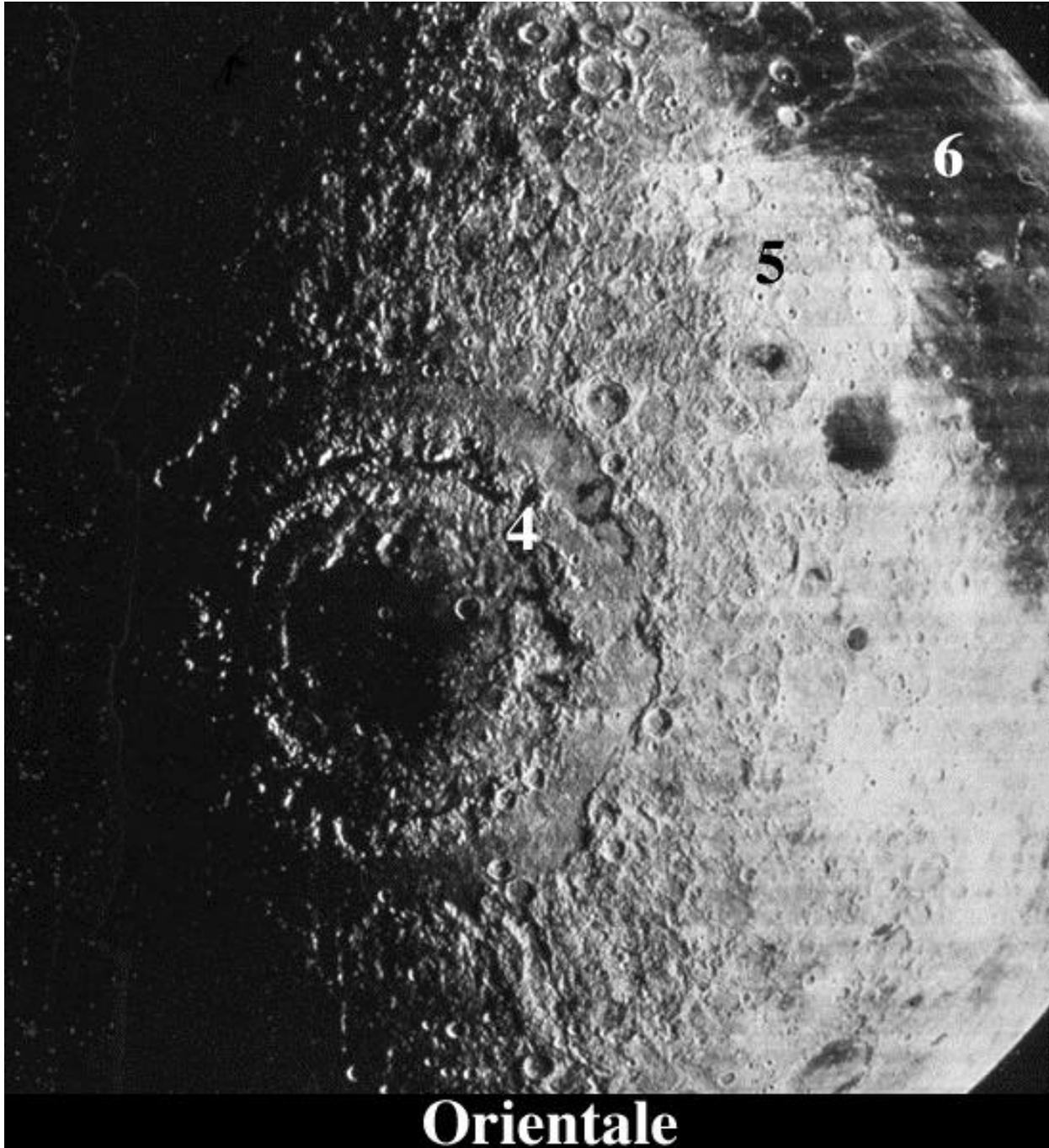
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**The Moon**

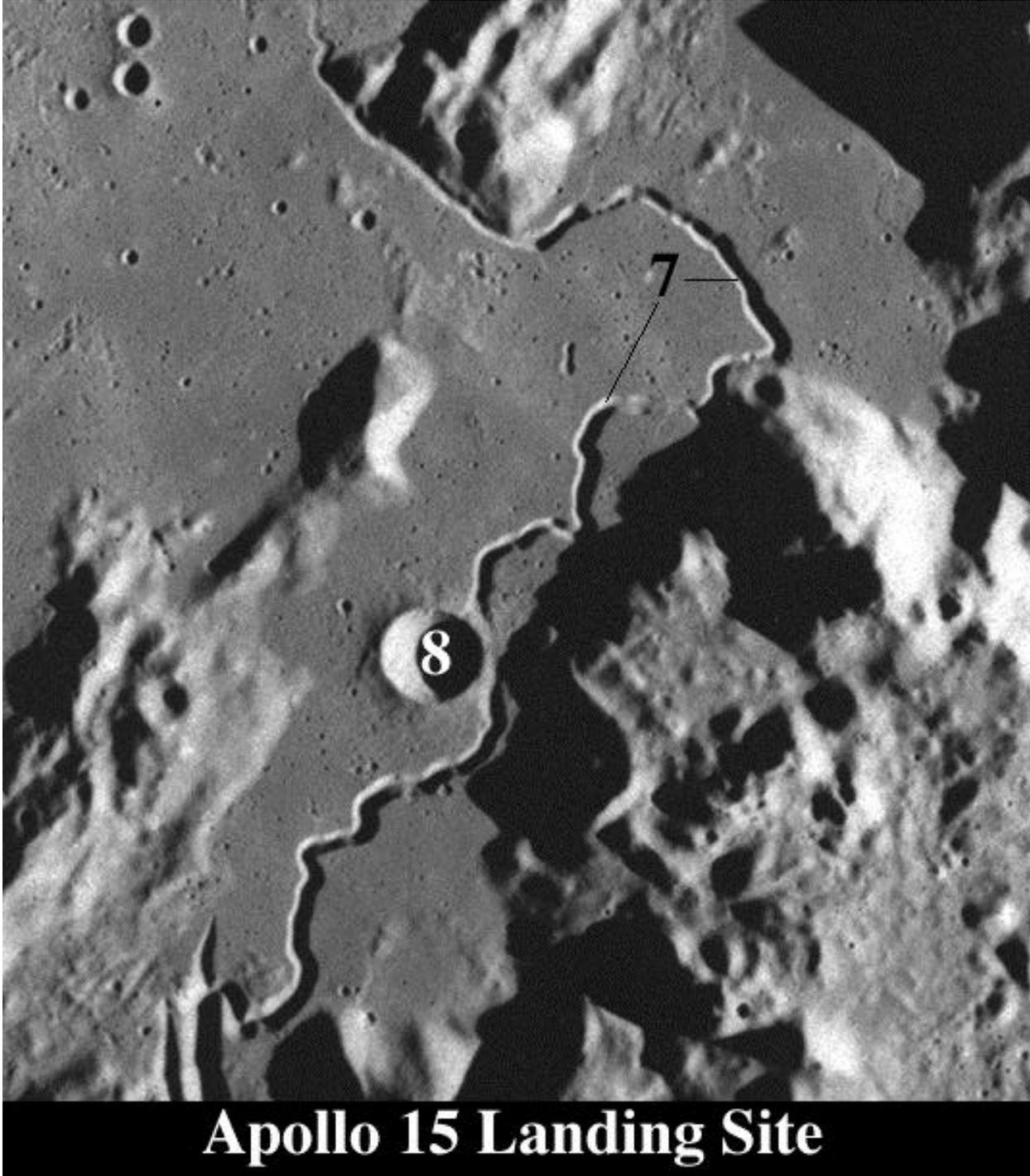


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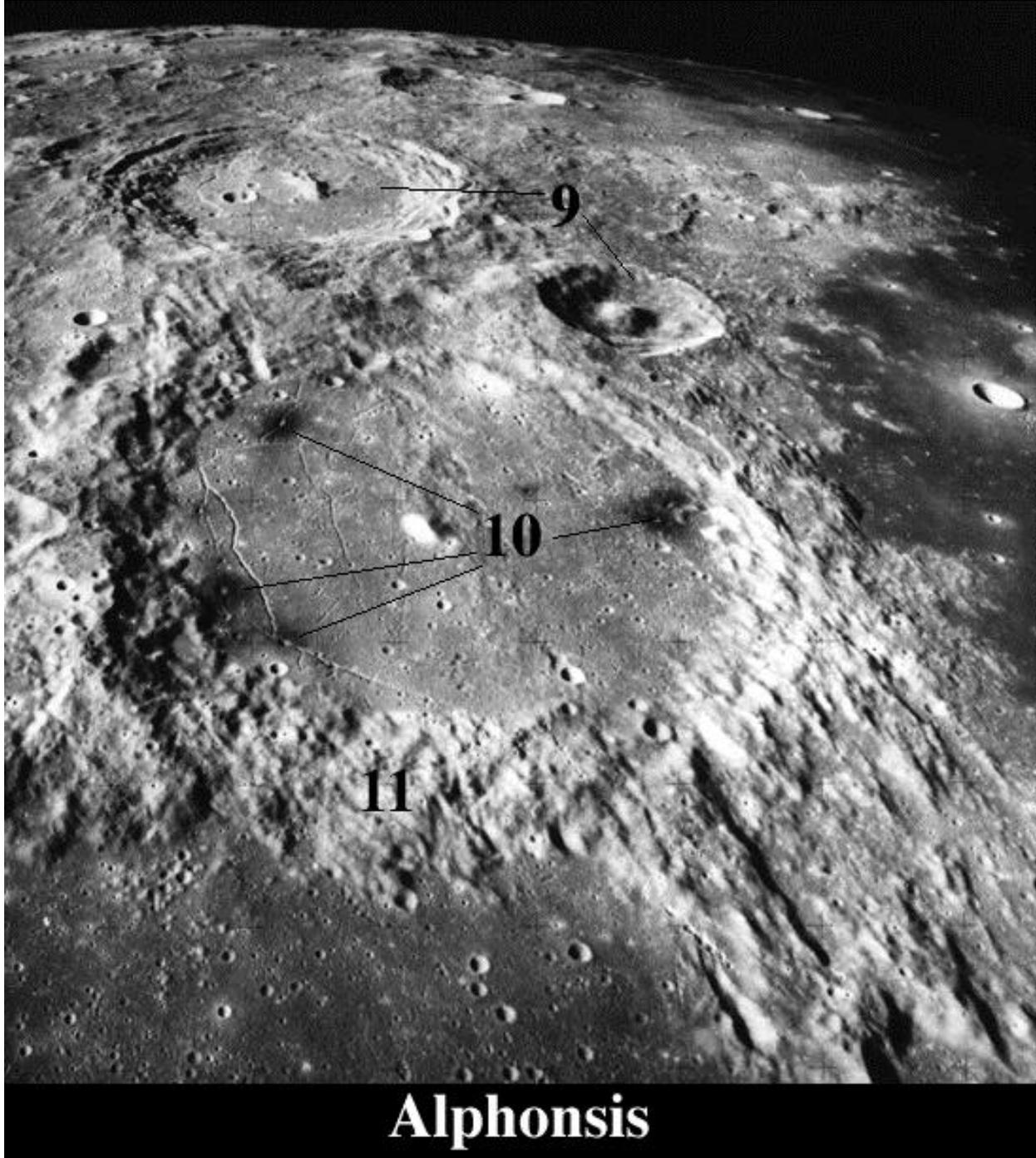


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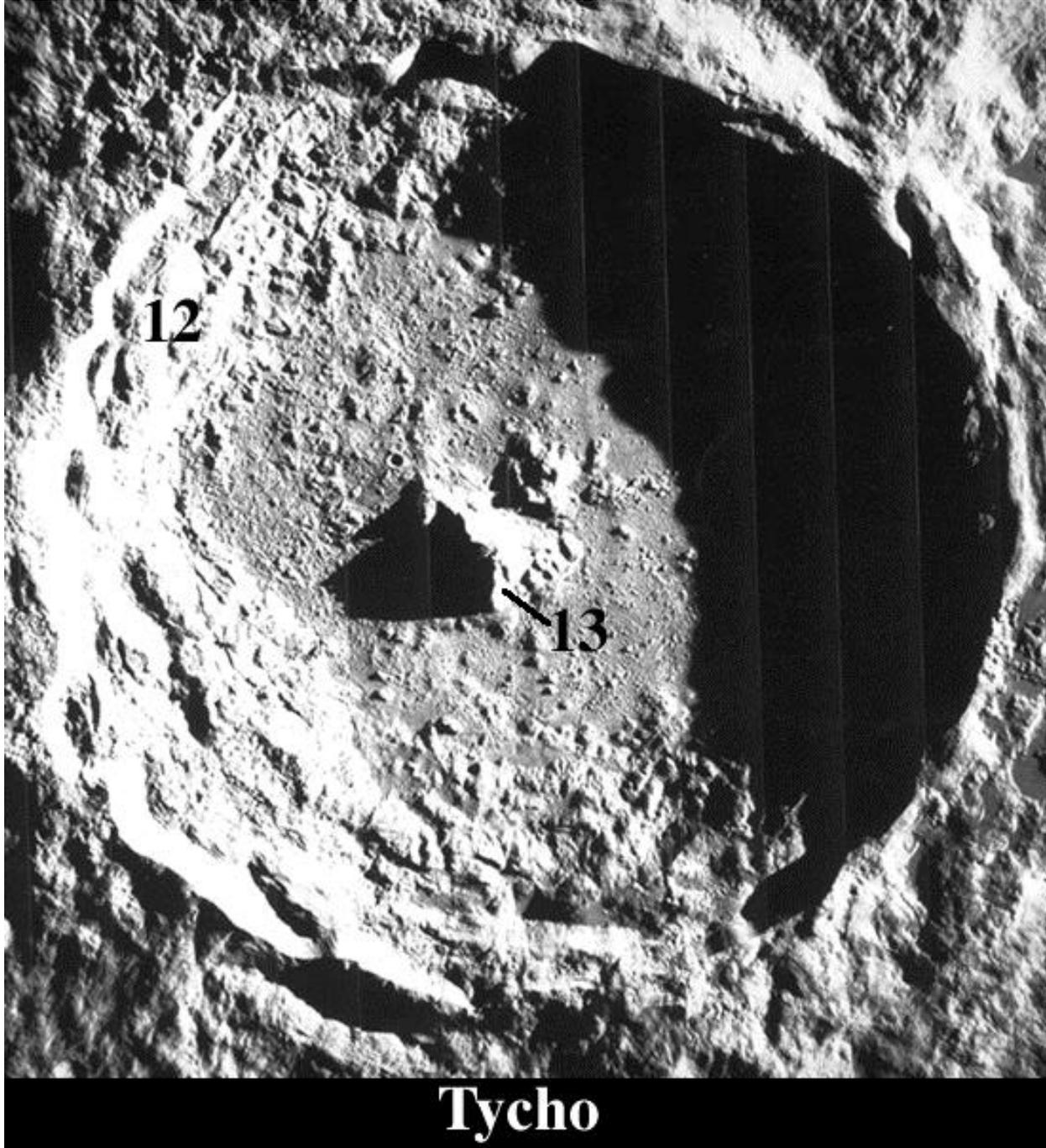
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**Alphonsis**

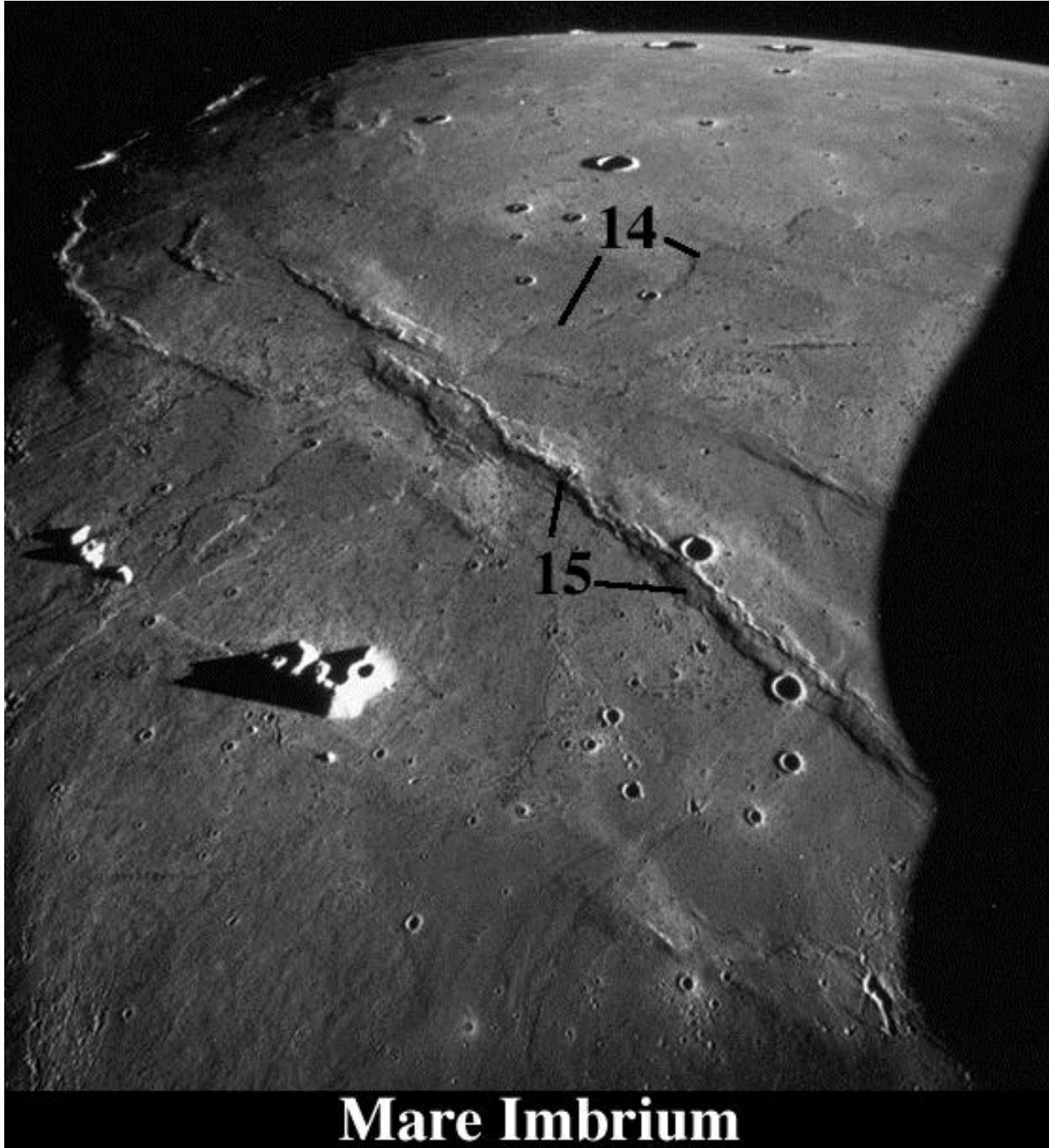


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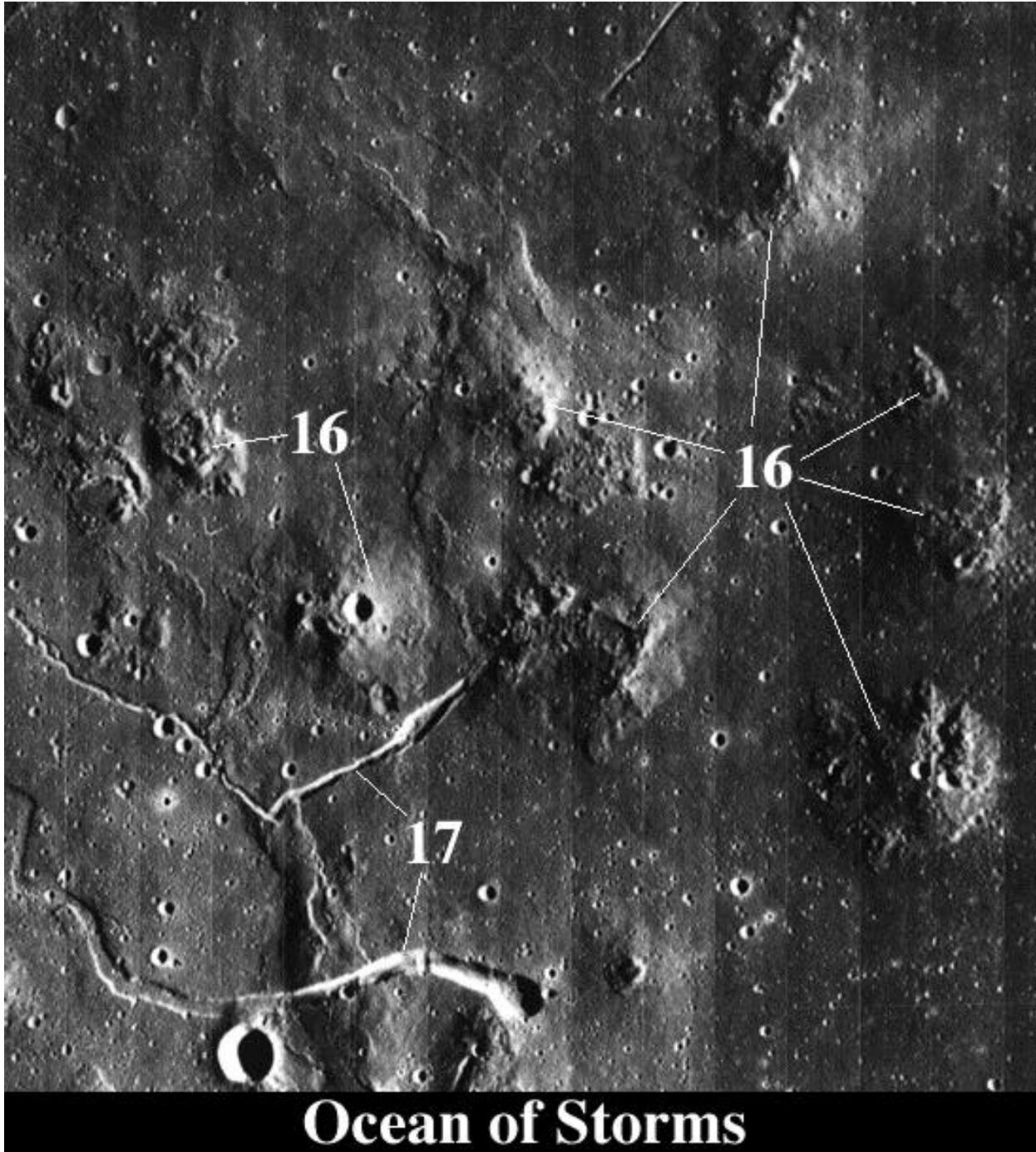


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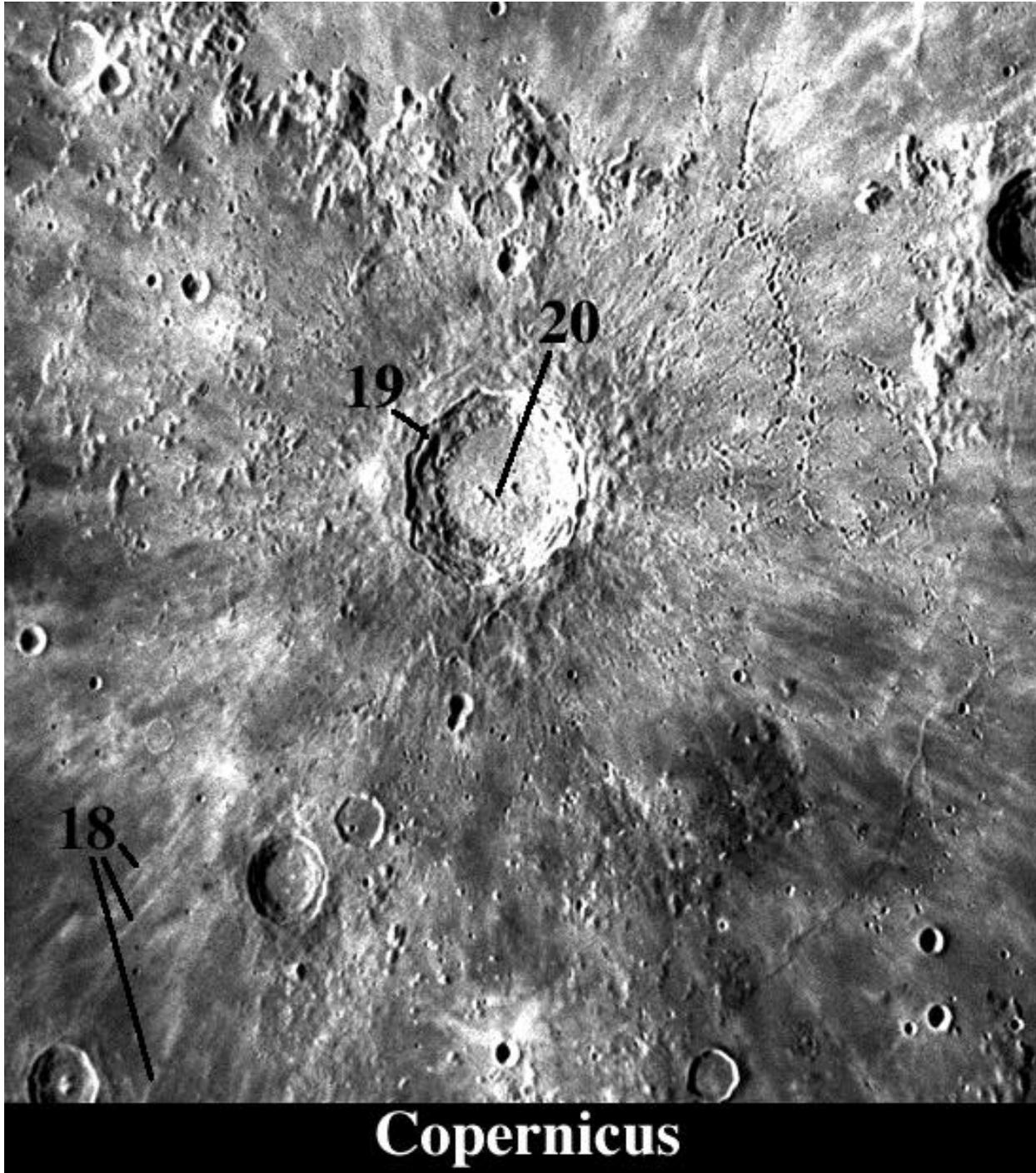


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## 14-Lunar Landform Identification – Student Page

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