

# CREATIVE THINKING—KEY TO SCIENTIFIC THINKING?

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# LEARNING OUTCOMES

- ▶ Make meaning of creativity and related habits of thinking
- ▶ Practice ways of developing creativity
- ▶ Create action plans to work on this habit of thinking

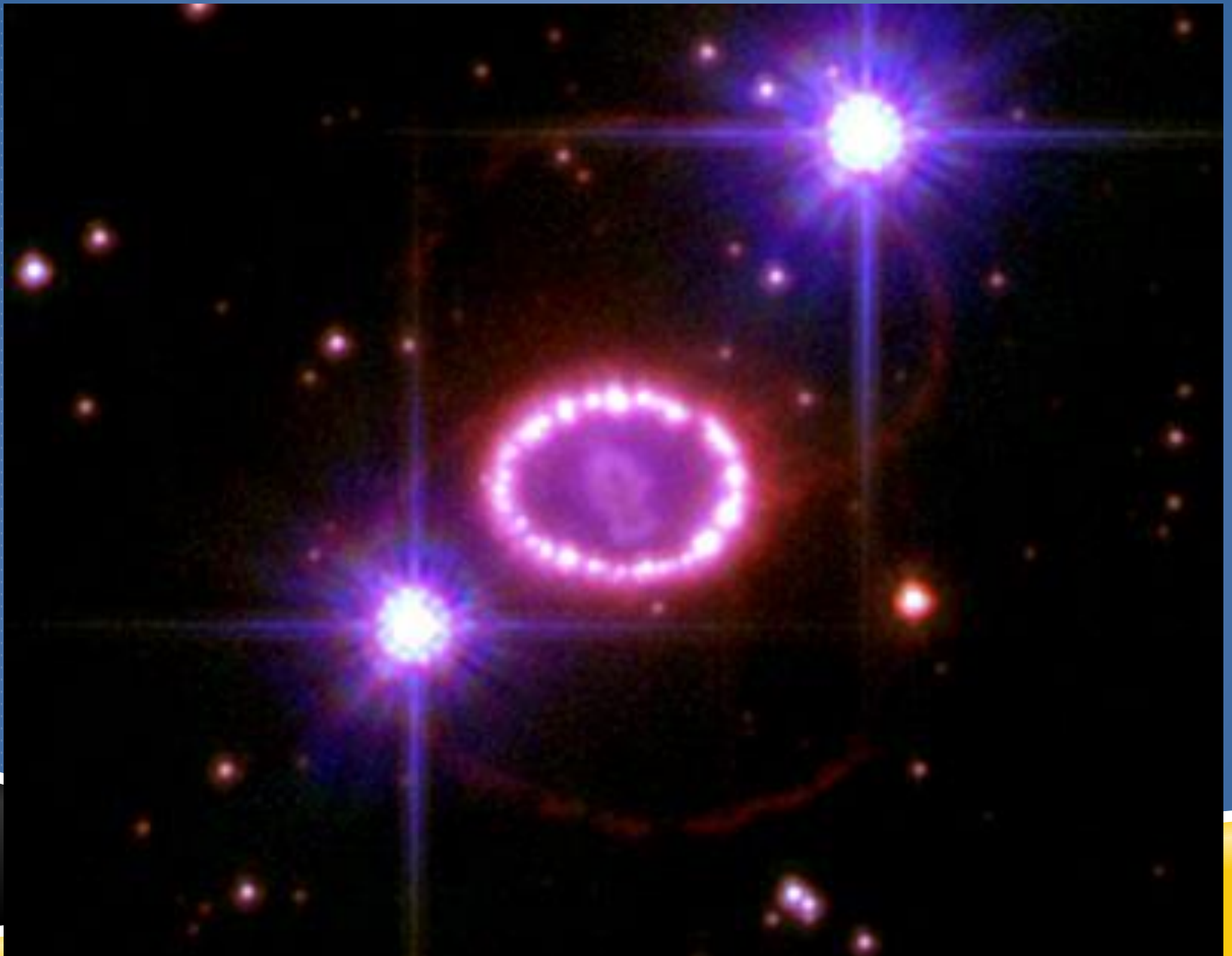
# CREATIVITY

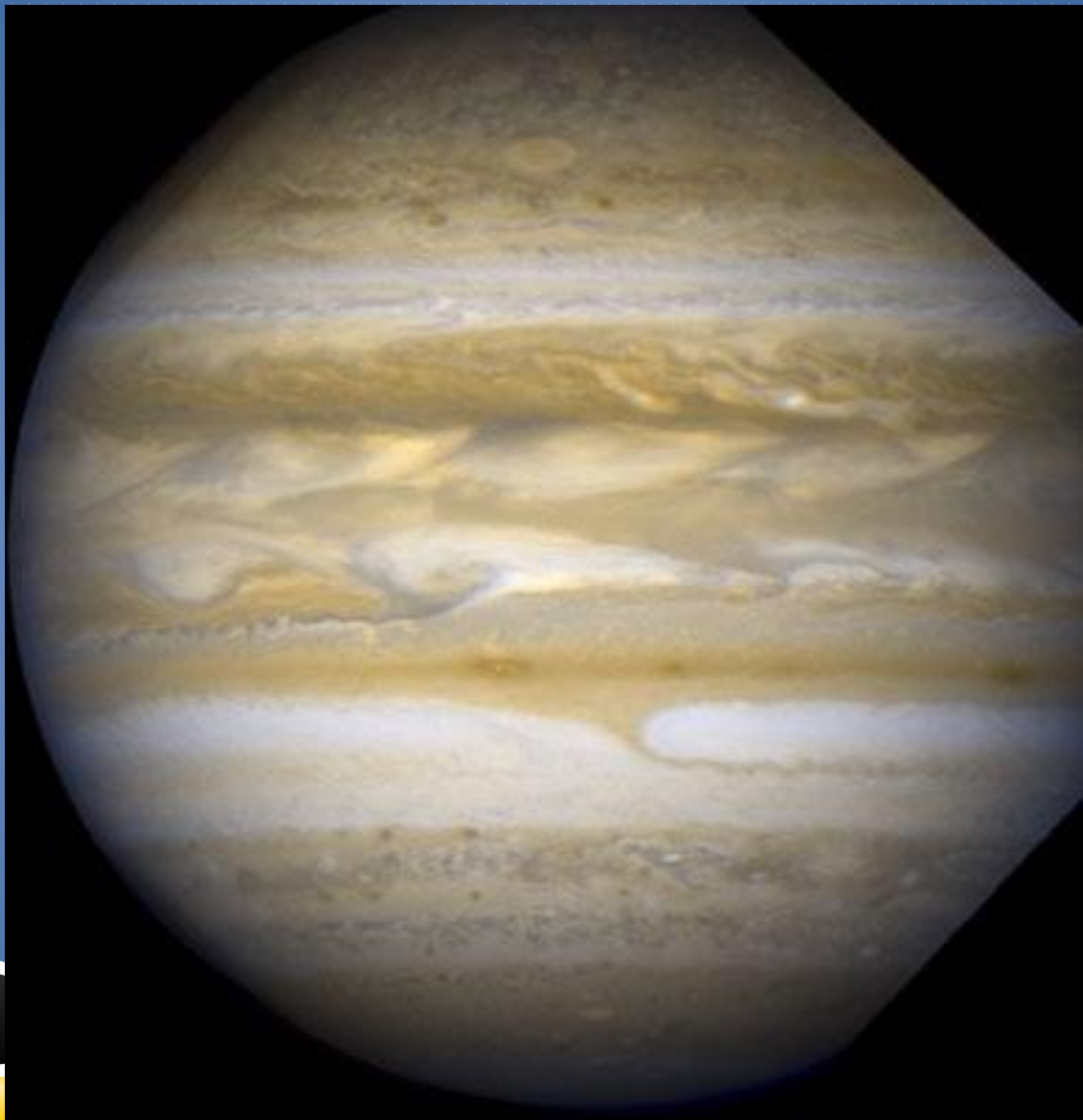
- ▶ “Pi chart”—what does creativity look like/sound like/feel like
- ▶ When is it important to be creative? Why?

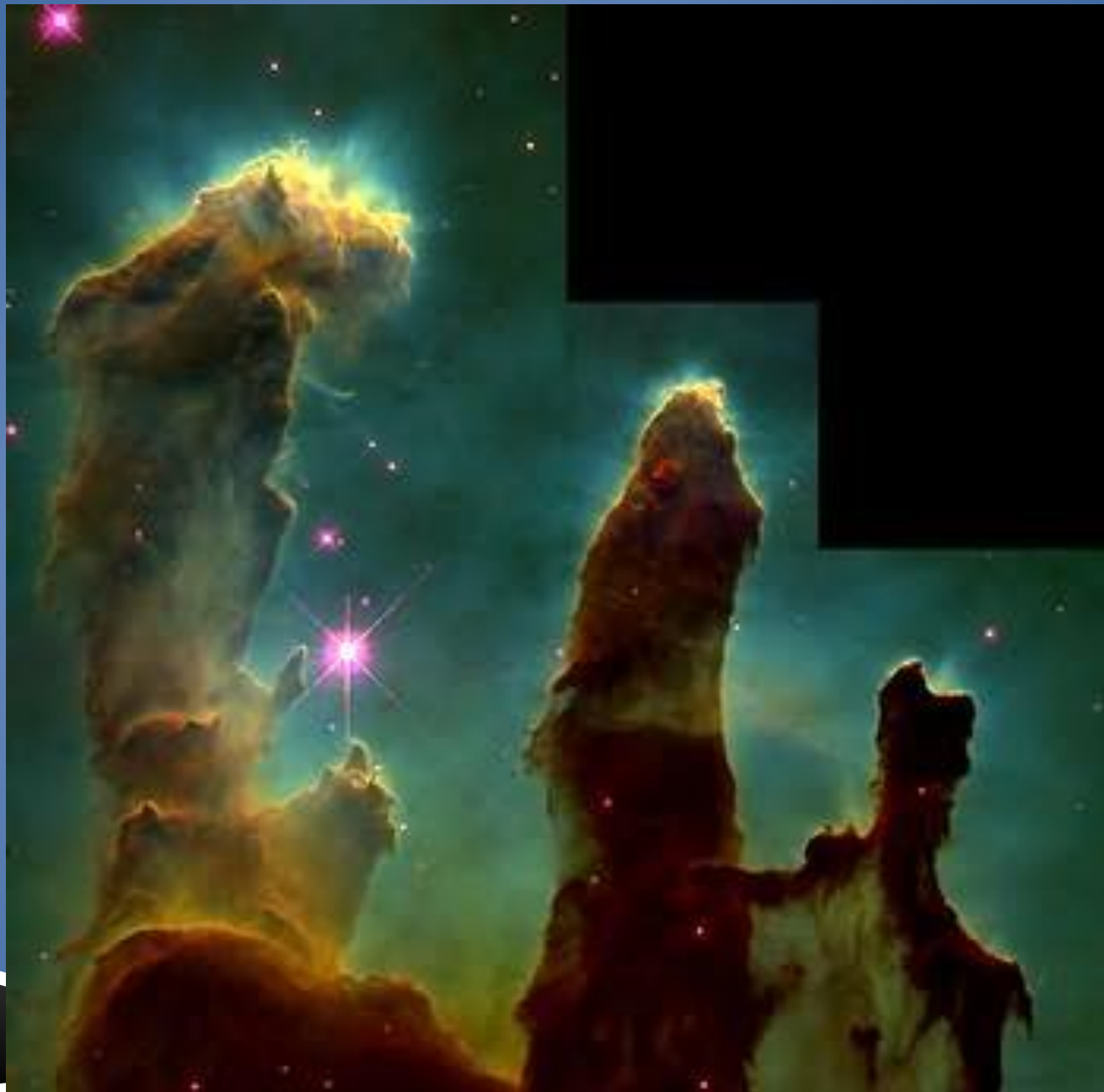
# EXPLORING DOMAINS OF CREATIVITY

- ▶ How many different uses can you think of for this plastic bottle?
- ▶ Fluency
- ▶ Flexibility
- ▶ Originality

THE WONDERS OF  
THE UNIVERSE—  
DOES EXPLORING  
“CREATION” MAKE  
YOU MORE  
CREATIVE?





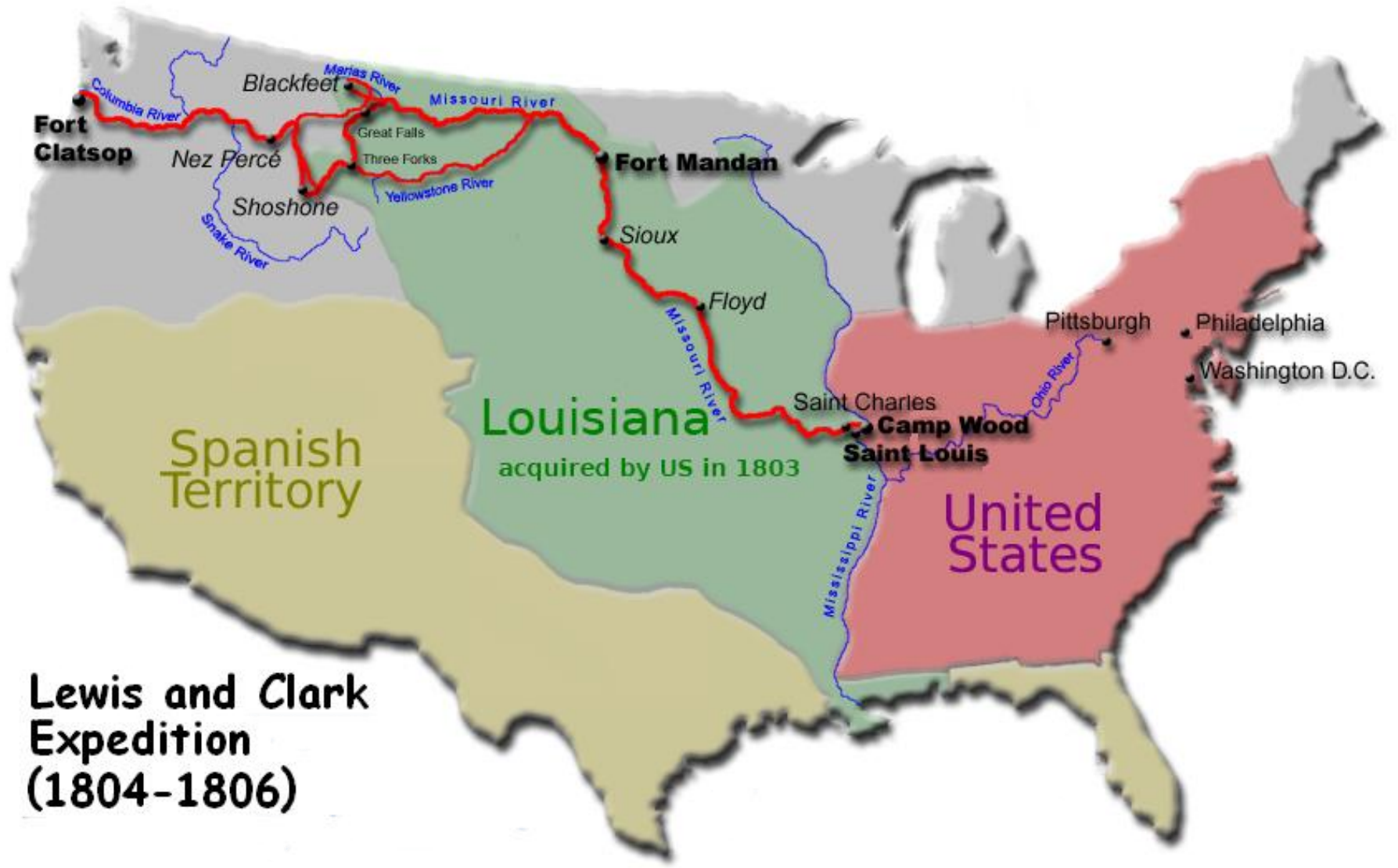




Sand Dunes, Mũi Né, Vietnam  
travelblog.org







**Lewis and Clark Expedition  
(1804-1806)**

**Fort Clatsop**

Spanish Territory

Louisiana  
acquired by US in 1803

United States

**Fort Mandan**

**Camp Wood**  
**Saint Louis**

Pittsburgh

Philadelphia

Washington D.C.

Blackfeet

Nez Percé

Shoshone

Sioux

Floyd

Saint Charles

Columbia River

Snake River

Maras River

Missouri River

Great Falls

Three Forks

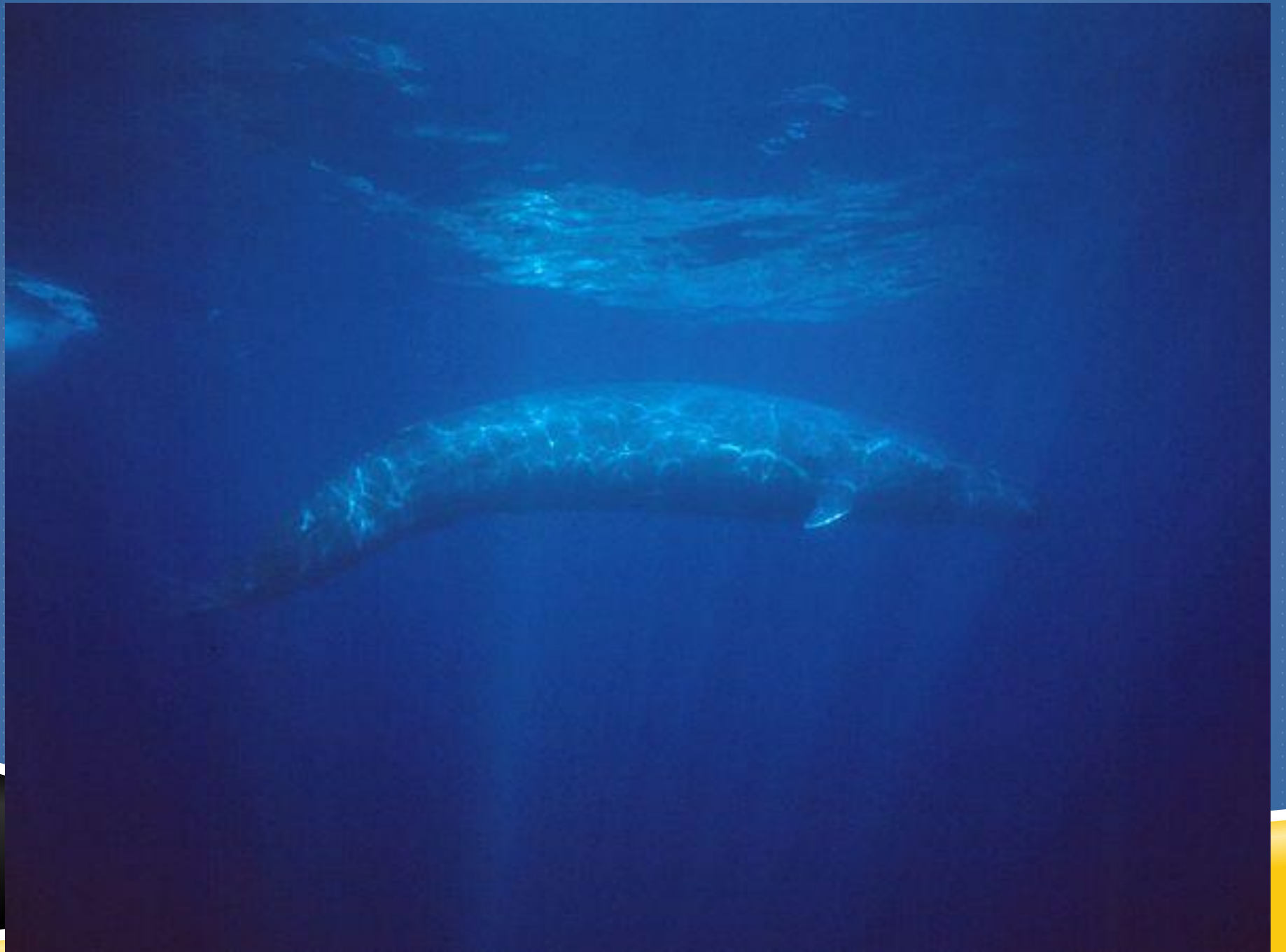
Yellowstone River

Missouri River

Mississippi River

Ohio River





# RESPONDING WITH WONDERMENT AND AWE

- ▶ How might this habit of thinking relate to creativity?
- ▶ Reflect/write/discuss—
- ▶ What value does “responding with wonderment and awe” have for us?
- ▶ How are “wonderment and awe” and creativity related?

# PRODUCTIVE PERSISTENCE

- ▶ How is the habit of productive persistence related to creativity?
- ▶ Examples?
- ▶ Write/discuss

# MORE CREATIVE PRACTICE

- ▶ In teams, create and be prepared to share
- ▶ an analogy (a comparison between two things, typically on the basis of their structure and for the purpose of explanation or clarification)
- ▶ or a metaphor (a thing regarded as representative or symbolic of something else, especially something abstract)
- ▶ For a scientific concept that you commonly use:
  - ▶ Protein complementarity
  - ▶ Energy balance
  - ▶ Gene expression
  - ▶ Foam formation by proteins
  - ▶ Emulsion formation
  - ▶ How botulinum toxin works

<https://www.youtube.com/watch?v=g8v6cZ21vlc>



# CREATIVITY

- ▶ Action plan—write down one thing you will do to work on your creativity