

# NOTE PROMPTS FOR COSMOS – EPISODE VIII: *Travels in Space and Time*

“To travel fast into space is to travel fast into the future”

1. Constellations appear different if we travel in \_\_\_\_\_

They also appear different if we travel in \_\_\_\_\_

2. Distances

When we see stars and galaxies, we see light from the \_\_\_\_\_

How fast does Voyager travel?  $c/$ \_\_\_\_\_

3. Who *was* the 16-year old high school dropout wandering the hills of Tuscany in the late 1800s?

What did he wonder, maybe for the first time, in Northern Italy?

The rules for avoiding paradoxes when traveling at high speed are called...

4. Describe the visual distortion experienced by an observer traveling near the speed of light.

What does time do for such an observer?

5. What did the British Interplanetary Society design in 1939?

*Project Orion* was an interstellar ship that uses what for propulsion?

What futuristic fuel does the *Dædalus* design use?

6. Within the next hundred years, distant space travel would require either of two design considerations (to account for the long time and short human lifespan)?

7. In a near-light speed ship as proposed by Sagan, Barnard's Star (6 light-years from earth and known in the 1970s to have planets\*) could be reached in how long (ship time)?

The Andromeda Galaxy (3,000,000 light years away) could be reached in (ship time)...

8. Time-travel speculation.

Sagan feels that if the Ionian scientific spirit had prevailed, humans would be more advanced by \_\_\_\_\_ centuries.

Five billion years ago, the solar system took shape.

"We owe the existence of our world to..."

9. In our system, the terrestrials are in close and the Jovians are more distant. What other planetary systems are possible?

10. The fragility of the timeline.

The earth and every living thing are made of...

By the time one-celled organism had evolved, the history of life on Earth was...

We are star-stuff which has taken its...

11. 1990 Update: Kip Thorne at CalTech suggested a method for rapid travel through space and time. The method involves...

(\*Evidence for a planetary system at Barnard's Star is no longer accepted, but the number of stars that appear to have planets is increasing at an accelerated pace as we get better at planet-hunting.)