GALACTIC EXPLORER

Mission Design Challenge

WELCOME

"Voyager did things no one predicted,
found scenes no one expected,
and promises to outlive its inventors.
Like a great painting or an abiding institution,
it has acquired an existence of its own,
a destiny beyond the grasp of its handlers."

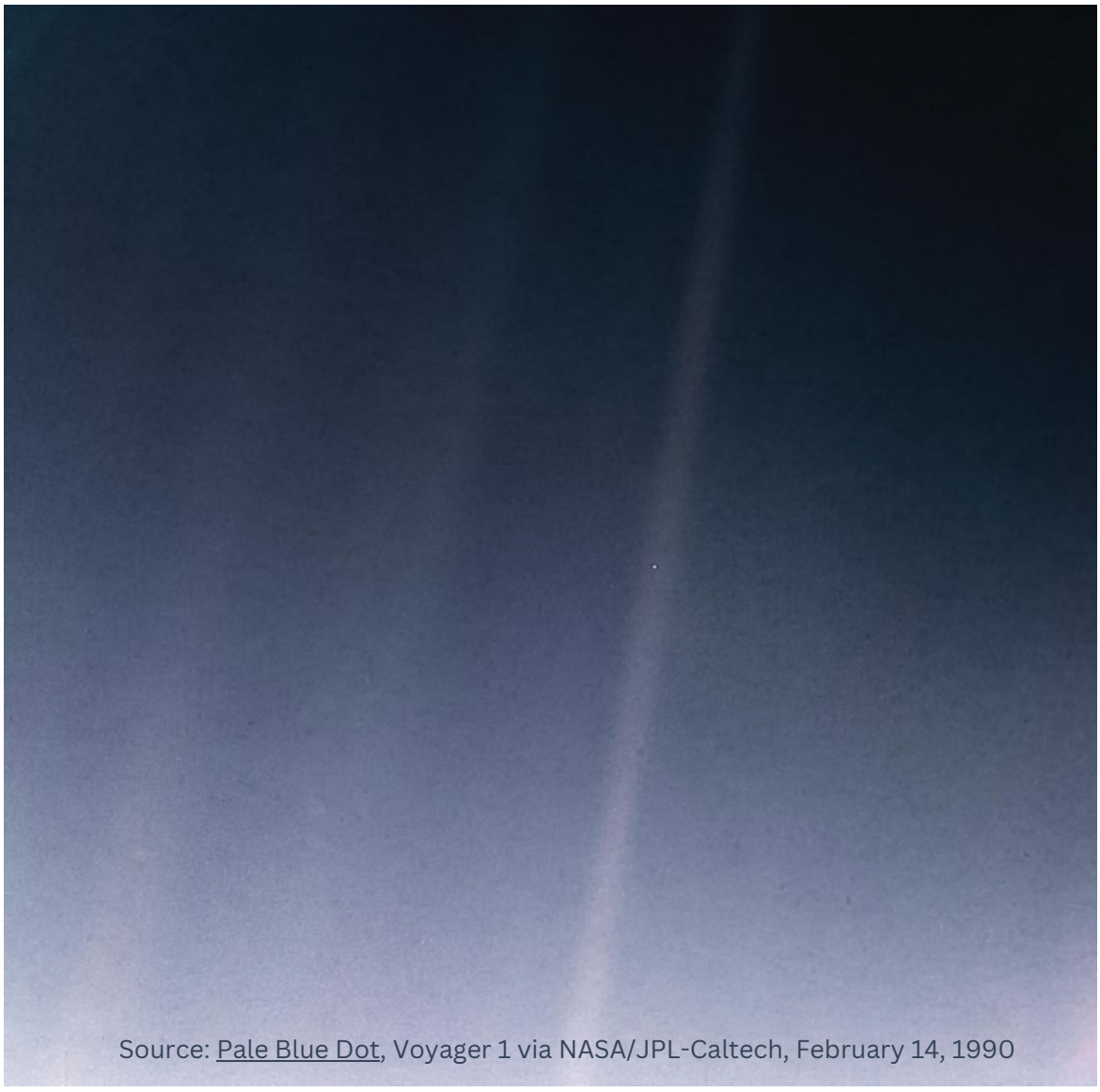
—Stephen J. Pyne

Since time immemorial, humans have looked up. If you are someone that looks up, welcome.

Resources

- Solar System (Wikipedia)
- Exoplanets (Wikipedia)
- Interplanetary Spaceflight (Wikipedia)
- Interstellar Travel (Wikipedia)
- Interstellar Probes (Wikipedia)
- Timeline of Solar System Exploration (Wikipedia)
- The Voyager Program (Wikipedia)
- List of proposed Spacecraft (Wikipedia)

DISCUSSION



Source: Pale Blue Dot, Voyager 1 via NASA/JPL-Caltech, February 14, 1990

"Look again at that dot.
That's here. That's home. That's us."
- Carl Sagan

CONTINUED

"From this distant vantage point, the Earth might not seem of any particular interest. But for us, it's different. Consider again that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every "superstar," every "supreme leader," every saint and sinner in the history of our species lived there – on a mote of dust suspended in a sunbeam."

Carl Sagan in Pale Blue Dot

THE MISSION

Every venture into space starts with an idea, and a person willing to rally others around it.

Today that person is you.

Pick a destination, define your mission, and begin exploring what it will take to get you to success.

Sound like a lot? It is, and the benefits of exercise will directly correlate to the effort you put into it.

Before you can go anywhere, however, you need to convince the powers that be to fund your endeavor.

Prepare a presentation outlining your proposal. You will deliver your presentation to the group (or if working alone, use parents or siblings). See if you can convince them of the value of your mission.

You will have five (5) minutes to present, and you may submit an accompanying proposal.

GET STARTED

These are questions to help you get started, so see them as an intellectual launch pad. Where you take them is completely up to you!

- Do you want to explore inside the solar system, or beyond the solar system?
- Will your mission be manned or unmanned?
- What is the purpose of your mission?
- Given the purpose of your mission, what essential technologies will you need onboard?
- What additional technologies could you add to increase the scientific value of your mission?
- What shape will your satellite / vehicle be, and why?
- How will your vehicle move?
- How can you make your satellite / vehicle go faster to minimize the duration of the journey?
- How will your vehicle communicate with Earth?
- If you plan to have people onboard, how many, who, and how will you select them?
- What conditions must your mission endure? How will you adapt to them?

EXOPLANETS

If you are willing to wait (a very long time), a mission beyond our solar system has the potential to unlock worlds that sound like science fiction. Examples:

WASP-76b. Originally thought to be home to iron rain, WASP-76b is extreme even without it, with daytime temperatures reaching approximately 2,500 ± 200 K (2,227 ± 200 °C; 4,040 ± 360 °F).

HD 189733b. Best viewed at a distance, HD 189733b boasts winds blowing 8,700 kilometers per hour (5,400 mph), and it rains molten glass.

TOI 849 b. 40 times the size of earth, but still rocky, TOI 849 b is a possible Chthonian planet, a gas giant stripped of its atmosphere by its star.

Kepler-186f. Even Kepler-186f, which conveniently sits in the habitable zone of Kepler-186, is not particularly pleasant, with an estimated equilibrium temperature of 188 K (−85 °C; −121 °F).

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