Distant Destinations Prototype Exhibit

Coordinator

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Curator for Aerospace Science, California Science Center

Outside Advisors

Curation and Exhibit Developer Team, California Science Center

Summary

Students in this Collaboratory will build an multiplayer museum exhibit that highlights the choices teams must make to successfully complete a deep space, human-piloted mission to one of the following destinations in our solar system: (1) resupply of an existing Moon base; (2) landing the first human crew on Mars or (3) excavating the surface of an outer planetary moon. Each challenge presents complex problems requiring a team of participants to adopt one of the following roles to collaboratively execute the mission: (1) Life Sciences Expert; (2) Propulsion Engineer; (3) Astronaut Scientist whose specialty will be determined by the mission; (4) Mechanical or Structural Engineer and (5) Data Base Manager responsible for research to support the other team members.

Students will think critically about all aspects of this project including the environmental conditions at the destination to which they will travel, the projected round-trip flight time and the hardware and logistical steps required to complete the engineering aspects of the mission once safely arrived at the destination. This will involve conducting research in multiple disciplinary fields including: the diverse planetary geology that describes our solar system; the basic concepts of orbital mechanics that describe flight trajectories; Newton’s laws that describe propulsion requirements; lethal biomedical hazards associated with space travel for which there are engineering design solutions that the students must devise and chronic biomedical hazards associated with long duration exposure to microgravity that must be addressed.

Students will develop a prototype multi-player, multi-media exhibit to acquaint the general public with the challenges of planning human-piloted deep space missions. The completed prototype exhibit will be floor tested with guests at the California Science Center to determine its effectiveness in communicating the main education messages and to determine the ease with which visitors manage to interface with the exhibit. The education messages are: (1) Space travel poses challenges, some common to all missions and some unique to
specific destinations; and (2) Multiple disciplines are essential for planning deep space exploration.

The students’ prototype exhibit will inform the development of a large multi-player exhibit entitled *Distant Destinations* for the California Science Center’s future Samuel Oschin Air and Space Center. During their collaboratory the students will meet for guidance and constructive critique with the California Science Center exhibit development team that includes Ken Phillips (Curator for Aerospace Science), Perry-Roth Johnson (Assistant Curator for Aerospace Science), Devin Waller (Exhibit Project Manager), Jeremy Stoller (Sr. Graphics Designer), Kathy Marsailes (Sr. Exhibit Designer), Jennifer Lawrence (Exhibit Developer and Copy Writer) and Jessica Bradt (Exhibit Developer and Aerospace Researcher).

**Meeting Times**

This collaboratory will meet each Thursday from 4:00pm – 6:00pm throughout Fall 2019. The Spring 2020 schedule will be determined in consultation with participating students.