

The search for life in the universe begins deep on Earth's ocean floors — and extends out to the stars!

Running time: 30:00
Grade level: 4-12 and general public audiences

Two of the most profound questions humans can ask are "Where do we come from?" and "Are we alone?" It is only natural that we look across the gulfs of space to search for other inhabited worlds.

Oceans In Space is a journey of exploration that seeks out places where conditions are favorable for life to exist. This original and thought-provoking presentation highlights the search for extrasolar planets and an understanding of the conditions necessary to form and sustain life. Inspired in part by the goals of NASA's Origins Program — an effort to answer the enduring questions that spur space exploration — this program introduces audiences to the diversity of life on our home planet even as humans embark on the search for life in the universe.

The story begins on Earth — on the shoreline of a tropical lagoon. The show travels back in time more than five billion years, to trace the origin and evolution of the solar system from a cloud of gas and dust. It then describes the formation of our planet's oceans, and speculates about the places where life could have begun nearly four billion years ago. It presents the three requirements for the nourishment of life on Earth — and most likely anywhere else in the universe: warmth, water, and organic material.



Today life on Earth flourishes in environments ranging from benign to downright alien, and the show examines the variety of life forms that populate our planet: from the creatures of the land to organisms that exist in the extreme conditions around volcanic vents on the ocean floors.

The possibility that life might exist in similar extreme environments elsewhere in the solar system prompts an exploration of two other worlds where the requirements for life might be met: Mars and the icy Jovian moon Europa.

The search for other life-bearing planets moves to starbirth nurseries in the Orion Nebula, and explains one technique today's scientists use to look for extrasolar planets. A science fiction-style ending portrays spaceship crews exploring the shores of an alien ocean far from Earth, in a scene taken from humanity's distant future.

Narrated by Avery Brooks
Written by Carolyn Collins Petersen
Produced by Mark C. Petersen
Original artwork by Michael W. Carroll and Tim W. Kuzniar

Oceans in Space is an original work commissioned in 1997 by the Springfield Library and Museums Association for the Seymour Planetarium of Springfield, Massachusetts.





Science Education Content

Oceans in Space provides an educational focus on the search for extrasolar planets and life in the universe via a set of multidisciplinary themes woven throughout the program that help relate the information presented in the show to the lives of students, families, and the general public.

Show content is relevant in these subject areas:

Earth and Space sciences:

- the origin and evolution of the solar system
- characteristics of Earth
- characteristics of Mars; evolution of Mars surface
- comparative planetology between Earth, Mars, and Europa
- Earth's oceans, their formation and effect on life, climate, and geological processes
- Martian meteorite analyses
- characteristics of Europa
- the formation of other stars and planetary systems
- the detection of planetary systems around other stars

Life sciences:

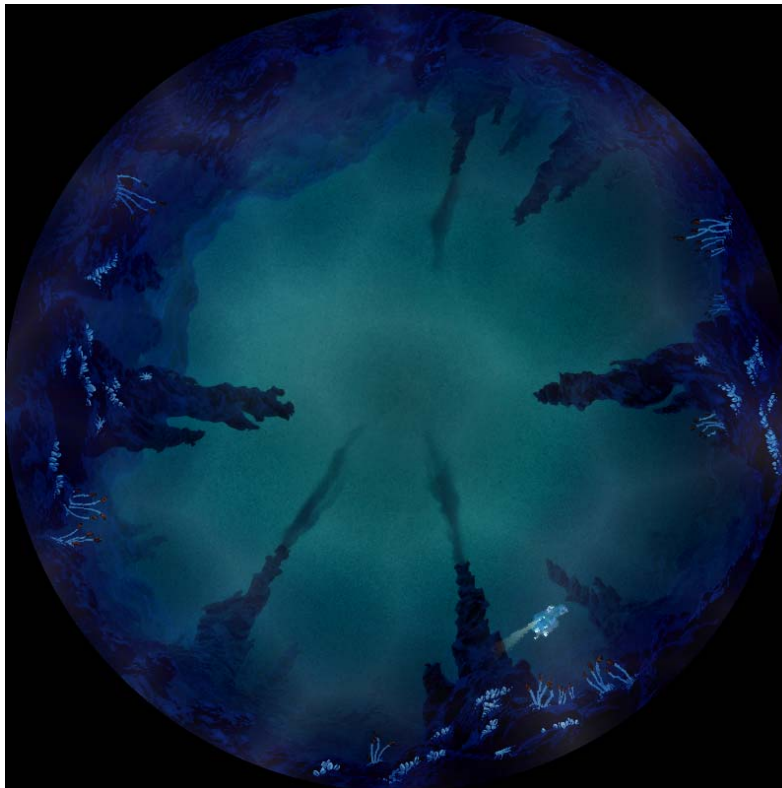
- the evolution of primordial life
- organisms and their environments on Earth
- the search for similar environments elsewhere
- requirements to sustain life (water, warmth, organic material)

Science as a human endeavor:

- exploring the undersea environment with specialized probes
- exploring Mars with telescopes and spacecraft
- exploring Europa with spacecraft
- exploring space with Hubble Space Telescope
- future missions to other planets to search for life

This show adheres to principles put forth in the National Academy of Sciences' Education Standards published in 1996. For more details, visit the NAS Standards Web site at: <http://books.nap.edu/html/nses/html/index.html>.

The submersible research vessel *Jason* studies life forms clustered around undersea volcanic vents ...



... just one of the ~54,000 dome master frames in this show.



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