

CONFERENCE ON LIFE IN THE UNIVERSE

A meeting to explore prospects for research
into the nature and distribution of life in the Universe

June 19 and 20, 1979

NASA Ames Research Center

General Chairman: John Billingham

PRELIMINARY AGENDA

June 19

ORIGIN AND EARLY EVOLUTION OF LIFE IN THE GALAXY

Chairman: Richard Young

- 9:00 a.m. Welcome
- 9:05 a.m. Introduction
- 9:15 a.m. Cosmic Evolution Eric Chaisson
An overview of the concept of cosmic evolution from the origin of matter to the rise of civilizations.
- 9:45 a.m. Organic Chemical Evolution Sherwood Chang
A review of chemical evolution emphasizing the environmental circumstances under which progressively more complex organic molecules will arise, with special attention to competing reactions and the conditions which govern reaction rates.
- 10:10 a.m. Biogenesis Alexander Rich
A discussion of the development of unicellular organisms from self-replicating molecular systems, with emphasis on environmental considerations.
- 10:35 a.m. COFFEE

June 19

Lynn Margulis

10:55 a.m. Evolution of the Biosphere
A discussion of the origin and evolution of planetary atmospheres and hydrospheres, including biological influences thereon.

11:20 a.m. Contributed Papers

12:00 noon LUNCH

AFTERNOON SESSION

1:30 p.m. Stellar Influences
A discussion of stellar characteristics and dynamics potentially related to the origin and evolution of life, including luminosity, spectral energy distribution, flares, spot activity, winds, and variability.

Adrienne Timothy

1:55 p.m. Orbit Stability
A discussion of the formation and longevity of planets in multiple star systems.

Robert Harrington

2:20 p.m. The Origin and Evolution of Continents and Oceans
A discussion of the development and stability of large contiguous land masses amidst bodies of water, including an evaluation of the importance of planet-specific factors.

Carl Turekian

2:45 p.m. COFFEE

3:05 p.m. Other Planetary Systems
An outline of prospects for the detection of extrasolar planets and the measurement of their gross physical characteristics.

David Black

3:30 p.m. Contributed Papers

4:55 p.m. Adjourn

6:00 p.m. DINNER

7:30 p.m. Biogeocosmopoetry: Major Events in the Evolution of Life on Earth and Speculations Regarding their Possible Relevance to Extraterrestrial Evolution.

J. William Schopf

June 19

8:15 p.m. Panel Discussion

Philip Morrison, Chairman
Helmut Abt
A. J. Boucot
A. G. W. Cameron

H. Masursky
John Oro
Tobias Owen
Richard Wetherald

10:00 p.m. Adjourn

June 20

THE EVOLUTION OF COMPLEX LIFE IN THE GALAXY

8:30 a.m. Introduction John Billingham

8:35 a.m. The Emergence and Radiation of Multicellular Organisms James Valentine

A discussion of the origin, evolution, and adaptability of various phylum-level biological strategies, including the importance of particular specialized organs and systems to the exploitation of different environmental opportunities.

9:00 a.m. Biological Evolution Dale Russell

A discussion of the evolution of complex organisms and ecosystems, with emphasis on factors responsible for its rate and direction.

9:25 a.m. Evolution of Technological Species Bernard Campbell

A discussion of the co-development of intelligence, manipulative ability, and social organization, with emphasis on environmental conditions required.

9:50 a.m. COFFEE

10:10 a.m. Climatological Stability Donald Hunten

A discussion of planetary characteristics which influence climate change, such as ocean currents, albedo, atmospheric composition, and variations in planetary motions.

June 20

10:35 a.m. Astrophysical Influences Wallace Tucker
A discussion of cosmic phenomena that might influence the rate and direction of biological evolution, including the evolution of the parent star, nearby supernovae, passage through galactic dust clouds, and violent activity in the galactic nucleus.

11:00 a.m. Contributed Papers

12:00 noon LUNCH

THE DETECTABILITY OF TECHNOLOGICAL CIVILIZATIONS

Chairman: Frank Drake

1:15 p.m. The Identifiability of Suitable Stars Kenneth Janes
A discussion of problems in the determination of important stellar characteristics, including temperature, luminosity, age, and chemical composition.

1:40 p.m. Manifestations of Advanced Civilizations Ronald Bracewell
A survey of possible characteristics of advanced technologies that might be observable across interstellar distances, including the possibility of deliberate communications.

1:55 p.m. Search Strategy Bernard Oliver
An analysis of the scientific and technological considerations which underlie a choice of search strategy.

2:20 p.m. COFFEE

2:40 p.m. The Radio Signature of Earth Woodruff Sullivan, III
An analysis of how Earth would appear to a nearby extraterrestrial civilization at radio frequencies and what that civilization might learn from observing it.

3:00 p.m. Sky and Frequency Surveys Robert Edelson
An outline of a practical program to search for powerful radio transmitters by using an all-sky, broad-frequency survey.

June 20

3:30 p.m.	High Sensitivity Observations An outline of a practical program intended to search for radio sig- nals from extraterrestrial civili- zations by maximizing sensitivity.	John Wolfe
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CONCLUDING EVENTS

4:00 p.m.	Reflections	Philip Morrison
4:30	Adjourn	