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Publications of the Exobiology Program for 1982

A Special Bibliography

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Publications of the Exobiology Program for 1982

A Special Bibliography

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INTRODUCTION

The Exobiology Program, within the Office of Space Science and Applications of the National Aeronautics and Space Administration, is an integrated program to methodically investigate those processes which may have been responsible for, or related to, the origin, evolution, and distribution of life in the universe.

This report contains a listing of 1982 publications supported by the Exobiology Program. Our intent in compiling this report is twofold: we want to provide the scientific community with an annual publication listing (as we have done since 1975), of current NASA-supported research in this field; and, we hope to stimulate the exchange of information and ideas among scientists working in the different areas of the program.

Researchers in the field might also be interested in NASA Conference Publication No. 2276, which contains session summaries and abstracts of the "First Symposium on Chemical Evolution and the Origin and Evolution of Life," organized by Donald L. DeVincenzi, held August 2-4, 1982 at NASA's Ames Research Center, Moffett Field, CA. The symposium provided an opportunity for all NASA Exobiology principal investigators to present their most recent research in a scientific meeting forum. In addition, the symposium served to foster increased communication across disciplinary lines, formulate a more integrated program approach, review progress in all tasks, and increase visibility of the Exobiology Program.

Research supported by the Exobiology Program is carried out in the areas of Chemical Evolution, Organic Geochemistry, Origin and Evolution of Life, Planetary Environments, Life in the Universe, Search for Extraterrestrial Intelligence (SETI), and Planetary Protection. Each area is defined as follows:

Chemical Evolution focuses on the nonbiological synthesis of biologically significant organic molecules under conditions presumed to have existed on the primitive earth or on any primitive planet before the advent of life.

Organic Geochemistry involves 1) analyzing ancient terrestrial rocks for organic molecules and inclusions of biological origin, and 2) developing techniques to isolate organic matter and to distinguish organic matter of biological origin from that of nonbiological origin.

Origin and Evolution of Life studies 1) the origin of essential life processes and systems including the nucleic acid and protein biopolymers, genetic information transfer, energy collection mechanisms, and cellular and subcellular structures, and 2) the evolution of primitive microbial ecologies.

Planetary Environments includes 1) characterizing microorganisms capable of surviving and/or growing in extreme conditions approaching those of planetary environments, 2) developing methodologies and techniques to detect and characterize life-related molecules in extraterrestrial environments, and 3) developing methods to determine planetary environmental characteristics important for chemical evolution processes.

Life in the Universe involves research and analysis in two distinct but related areas: 1) forms, abundances, and reactivity of the biogenic elements; and 2) effect of planetary, solar, and astrophysical phenomena on evolution of complex life.

Search for Extraterrestrial Intelligence (SETI) involves the search for extraterrestrial intelligent life by detecting signals in the microwave region of the spectrum.

Planetary Protection focuses on 1) environmental protection of planets of biological interest from potential harmful contamination from terrestrial sources during future exploration, based on explicit guidelines established for each planet and for each type of mission, and 2) protection of the Earth from potential hazards posed by returned sample missions.

The bibliography is divided into the seven research areas noted above and a miscellaneous section. Within each research area, references are listed alphabetically by author. Authors who are principal investigators are identified by an asterisk. Abstracts are listed separately starting on page 21. In addition, current addresses for all principal investigators are given in the Appendix.

We wish to thank all the participants in the Exobiology Program for their cooperation in responding to our request for a listing of their 1982 publications.

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