

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Interactive Presentations - IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (IP)

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## ASTROBIOLOGY AND EXPLORATION

**Abstract**

Astrobiology and exploration are important topics in the field of science. It looks into the possibility of finding and studying extraterrestrial life forms and finding ways to explore the outer reaches of space. Astrobiology relies on a multidisciplinary approach ranging from astronomy to chemistry, biology, and more. The exploration of outer space continues to be a major focus of scientific discovery. This exploration has led to the discovery of planets around other stars and exoplanets, which could potentially harbour life. Astrobiology research has also investigated the possibility of life on Mars and in other places throughout the universe. Astrobiology research also explores topics such as the biotic and abiotic conditions of various planets and the moon and how these might influence the presence and distribution of life, the adaptation of organisms to extreme environments, and the origin and evolution of life in the universe. Astrobiology research requires advances in technology, such as instruments to image planets and collect data from them. It involves both theoretical and observational investigations, and researchers continuously seek out new methods and theories to explain the origin and evolution of life in the universe. Astrobiology is one of the most exciting fields of research today and it will continue to be an important part of scientific exploration and discovery. Astrobiology is the study of the origin, evolution, distribution, and future of life in the universe. It is an interdisciplinary field that combines elements from astronomy, chemistry, geology, and other scientific disciplines. Astrobiologists use a variety of observational and experimental tools, including telescopes, spectrometers, and spacecraft, to explore and study distant regions of space. They also use laboratory experiments and computer simulations to understand the behaviour and evolution of complex systems in extreme environments such as deep space. Additionally, astrobiologists study extrasolar planets and look for signs of Martian life. Astrobiologists search for biosignatures – any chemical, physical, or morphological clues that might indicate the existence of living organisms – in the universe. This involves analyzing data from astronomical observations and astronomical models, such as those of planetary formation and evolution. Astrobiologists also study the implications of extraterrestrial lifeforms on our understanding of life, including the development of new theories in fields such as genetic engineering, astrochemistry, exobiology, and space exploration. By studying extraterrestrial lifeforms, scientists can potentially develop new technology and techniques to better understand the nature and origin of life on Earth.