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28th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Interactive Presentations - 28th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (IP)

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BASIC DISTRIBUTION OF UNDERGROUND COLONIES ON MARS BASED ON METHODS USED BY ANTS: THE DEVELOPMENT OF 100 MILLION YEARS OF EVOLUTION EMPLOYED IN HUMAN INTERPLANETARY EXPLORATION.

Abstract

The constant research and human exploration on the planet Mars have resulted in the possibility of colonization in the future, but this means that just as there is an opportunity, there are also issues and challenges that must be solved and considered beforehand so that the safety and quality of life of the future inhabitants can be guaranteed. This has also resulted in a number of proposals where most conclude that one of the best options is the construction of permanent habitats below the surface to minimize as much as possible the detrimental health effects of radiation.

The delivery of resources and supplies is a factor that conditions the way in which future exploration and colonization missions will be organized, and international cooperation will play an important role in the construction and subsequent development of these settlements. One of the challenges, therefore, is the efficient and optimal organization of human settlements on Mars.

A basic approach to space distribution is the one used by ants in their colonies, with sophisticated networks of main tunnels that connect with vaults that perform different functions. This form of organization also contributes to the temperature regulation of the anthill and to the transfer of the ants to their respective work areas, which is done through main networks and, if for some reason, these networks are saturated, there are secondary tunnels that allow access to the different vaults of the anthill. This is a basic underground distribution and by studying different anthills we can propose the conceptual design of a human settlement below the surface of Mars.

Why ants? Ants are groups of animals that evolved from wasp-like ancestors in the mid-Cretaceous, between one hundred and ten and one hundred and thirty million years ago. Most notable is their amazing ability to communicate, which allows their colonies to function as superorganisms. In addition, they have developed very interesting social structures and behaviors from which we can learn to later adapt them to our needs, which is why through the collection and classification of data we will present a conceptual design in which we will divide the areas of human settlement in a manner analogous to how ants would do it.