The IMSA Great Minds Program®

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Lynn Margulis

Abstract:

The Living Earth From Space

Cosmonauts and astronauts are awed by the "blue marble," the face of the Earth alive as viewed from nearby orbit. The Gaia hypothesis, a product of the lively imagination of British atmospheric chemist James E. Lovelock and the international space program, states that the air is physiologically regulated. The atmospheric temperature at the Earth's surface, its reactive chemical composition, acidity and oxidation state, are modulated by the past and present activities of living matter. The biota (i.e., the biomass or sum of the flora, fauna and microbiota) grows exponentially and comprises some estimated 30 million species that ultimately depend on energy from the sun. Biological diversity is required for Gaia's spirit (the air) and its chemical elements of carbon, hydrogen, nitrogen and phosphorus. These element cycles are absolute consequences of the continuation of life on our planet; Gaia's spirit has persisted for over 3000 million years. Estimates of the material needs of burgeoning human populations need to be based more accurately on Gaian science. The Gaia hypothesis, generative of new concepts leading to experiments, observations and calculations, is unequivocally a modern scientific idea.