INTERDISCIPLINARY TEACHING, A FIRST STEP TOWARD INTERDISCIPLINARY ASTROBIOLOGY RESEARCH.

J. Gale, Institute of Life Sciences, The Hebrew University of Jerusalem, Jerusalem 91904, Israel. galej@vms.huji.ac.il.

Astrobiology is highly eclectic and challenging for both students and teachers. It is a subject which attracts much attention, at least at the undergraduate level. Over the last ten years we have developed an elective, third year undergraduate course, which enrolls some thirty to fifty students, annually. The students major in different fields, including Biology, Environmental studies, Astronomy, Earth sciences and others. The format is that of a workshop, which includes the preparation of written and presented term papers, with much emphasis on class discussion. The course begins with a series of introductory talks by the workshop lead lecturer and invited experts from the different disciplines represented in Astrobiology. In this way the course differs from many others which are given by single specialists, mainly in the field of their own knowledge, be it Astronomy, Earth Sciences or Biology.

Another rather unique aspect of this course is that it is Earth-centric, and deals with the general subject of the "Astrobiology of Earth" [1]. The central theme is how the factors of the larger universe, including planet Earth itself, determined the conditions of the Biosphere which enabled the emergence of life, and influenced its evolution throughout the last ~ 3.8 Gy. Students are encouraged to analyze the environmental interrelations of extraterrestrial factors, those of Earth itself and the Biosphere. For example, they study the effect of Earth incident galactic cosmic radiation, as affected by the Solar Wind and the magnetosphere, on cloud formation (and hence Earth's albedo and weather) and on evolution-driving mutagenesis. By studying the highly precarious nature of the quasi-equilibrium of the Biosphere, students are brought to understand how easily humans may perturb this delicate balance, to the detriment not only of other species but of themselves.

We have no specific post-graduate Astrobiology studies or research groups in our school (or elsewhere in Israel). Students interested in pursuing Astrobiology for their graduate studies are advised to choose a subject and thesis supervisor in one of the specialty disciplines. Generally the lack of research funding and future research and employment opportunities discourage students from specializing in Astrobiology. The situation is probably similar in most small countries. International travel grants and scholarships for graduate study within existing Astrobiology research groups, could be of mutual benefit to both the recipients and the grantees.

[1] J. Gale (2009). Astrobiology of Earth; The Emergence, Evolution and Future of Life on a Planet in Turmoil. *Oxford University Press (UK).*