

**THE HARVARD-MIT PHD PROGRAM IN BIOASTRONAUTICS<sup>1</sup>**Laurence R. Young<sup>(1)</sup>, Alan Natapoff<sup>(2)</sup>, and Julie Greenberg<sup>(3)</sup><sup>(1)</sup>*Massachusetts Institute of Technology*, Room 37-219, Cambridge, Massachusetts 02139Email: [lry@mit.edu](mailto:lry@mit.edu)<sup>(2)</sup>*Massachusetts Institute of Technology*, Room 37-219, Cambridge, Massachusetts 02139Email: [natapoff@mit.edu](mailto:natapoff@mit.edu)<sup>(3)</sup>*Harvard-MIT Program in Health Sciences and Technology*, Institute of Medical Engineering and Science, Room E25-518, Cambridge, Massachusetts 02139Email: [jgreenbe@mit.edu](mailto:jgreenbe@mit.edu)**ABSTRACT**

The National Space Biomedical Research Institute (NSBRI)<sup>1</sup> supports a PhD program offered by the Harvard-MIT Program in Health Sciences and Technology (HST) under the Institute of Medical Engineering and Science (IMES), with a specialization in Bioastronautics<sup>2</sup>. The program changes its form substantially after this year with the closing of the NSBRI and termination of its graduate education activity. It continues to prepare future leaders in space life sciences to meet the challenges of protecting humans in the hostile space environment, to deal with the scientific issues of gravitational biology, and to make creative use of human presence in space for research and exploration. This educational offering, which will continue without NSBRI support, is a part of HST's Medical Engineering and Medical Physics (MEMP) program, HST-IMES's framework for granting the PhD degree. Since its inception in 2002 the program has granted PhD degrees to 9 students who have remained active in space-related fields. Seven other students are continuing their research and studies in the program. HST-MEMP provides broad training at the interface of science, engineering and medicine, and opportunities for thesis research in a wide variety of laboratories in the Harvard-MIT community. The specialization in Bioastronautics adds tailored engineering courses in aerospace biomedical engineering, human factors engineering, and space systems engineering; electives in radiation biophysics, sensory-neural systems, and bone and musculoskeletal pathophysiology; a weekly bioastronautics journal article seminar; a summer program that begins with a week of special lectures and orientation hosted in Houston by the Baylor College of Medicine and is followed by a two- to three-month internship at Johnson Space Center (JSC); and an optional clinical preceptorship at a NASA center. These courses and hands-on field experiences prepare students for careers in space, from industry to NASA to academia.

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<sup>2</sup> <http://hst.mit.edu/bioastro>