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HARVARD UNIVERSITY

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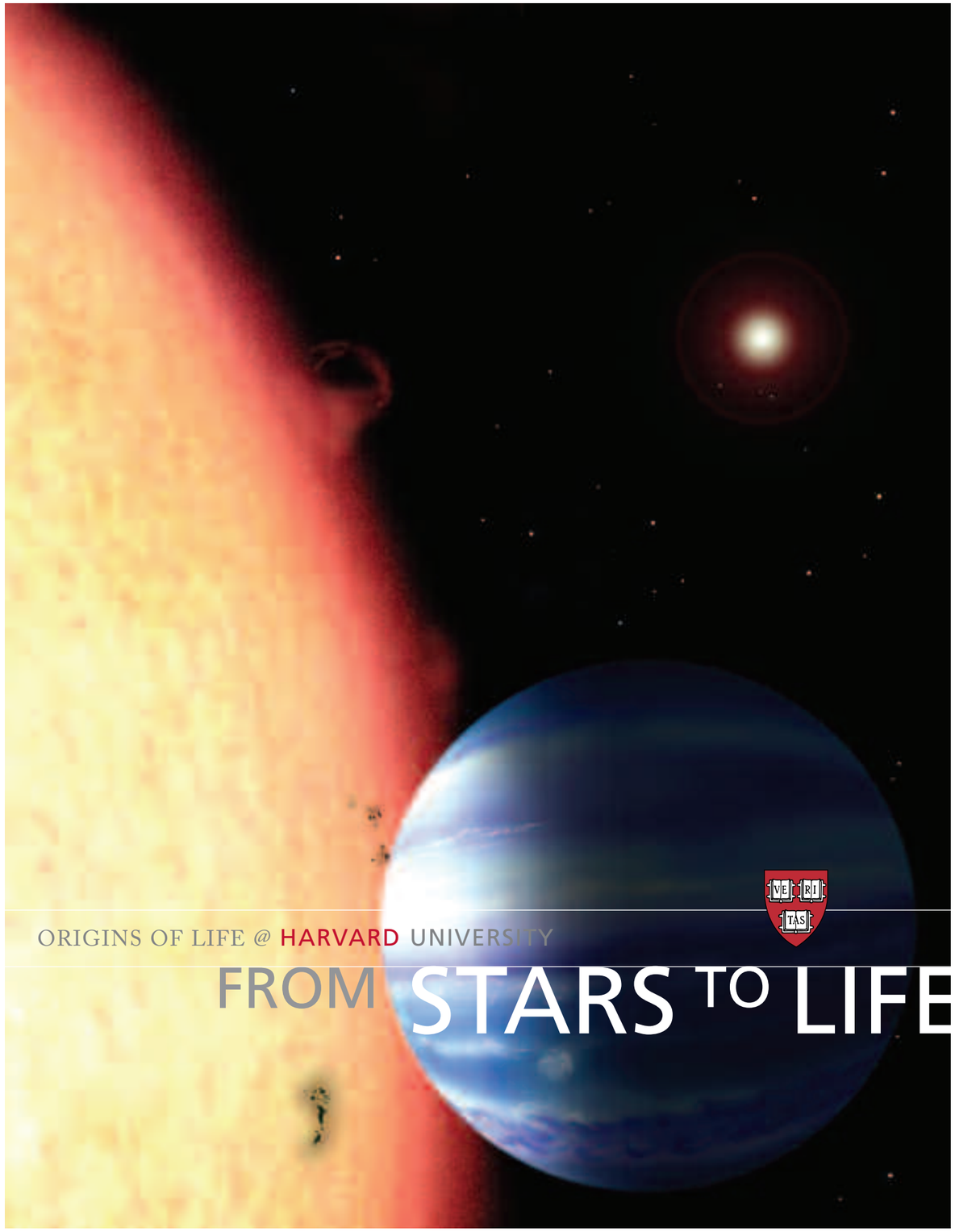


ORIGINS OF LIFE @ HARVARD UNIVERSITY

FROM STARS TO LIFE

ORIGINS OF LIFE@HARVARD

People have wondered about and debated how life on Earth began for thousands of years, asking seemingly unanswerable questions throughout recorded history. How did life originate and evolve? Is there life on Mars? Does life exist elsewhere in the universe? What is life's future direction? Today, the question of the origins of life in the universe remains one of humankind's most compelling mysteries. However, new answers may be experimentally accessible, thanks to combined advances in biology, chemistry, genetics, geology, and astronomy.

Approaching a question that has dominated much of human history requires the combined effort of most of science at the University. At Harvard, astronomers search for undiscovered planets that may be hospitable to life; planetary astrophysicists study how planets form and survive; geochemists analyze sedimentary rocks on Earth and Mars to uncover planetary processes and environmental changes throughout history; chemists and chemical biologists consider the simple molecules on primitive planets and focus on the route to assemble complex self-replicating molecules; and molecular biologists concentrate on the ultimate leap—how biological evolution can emerge from chemistry.

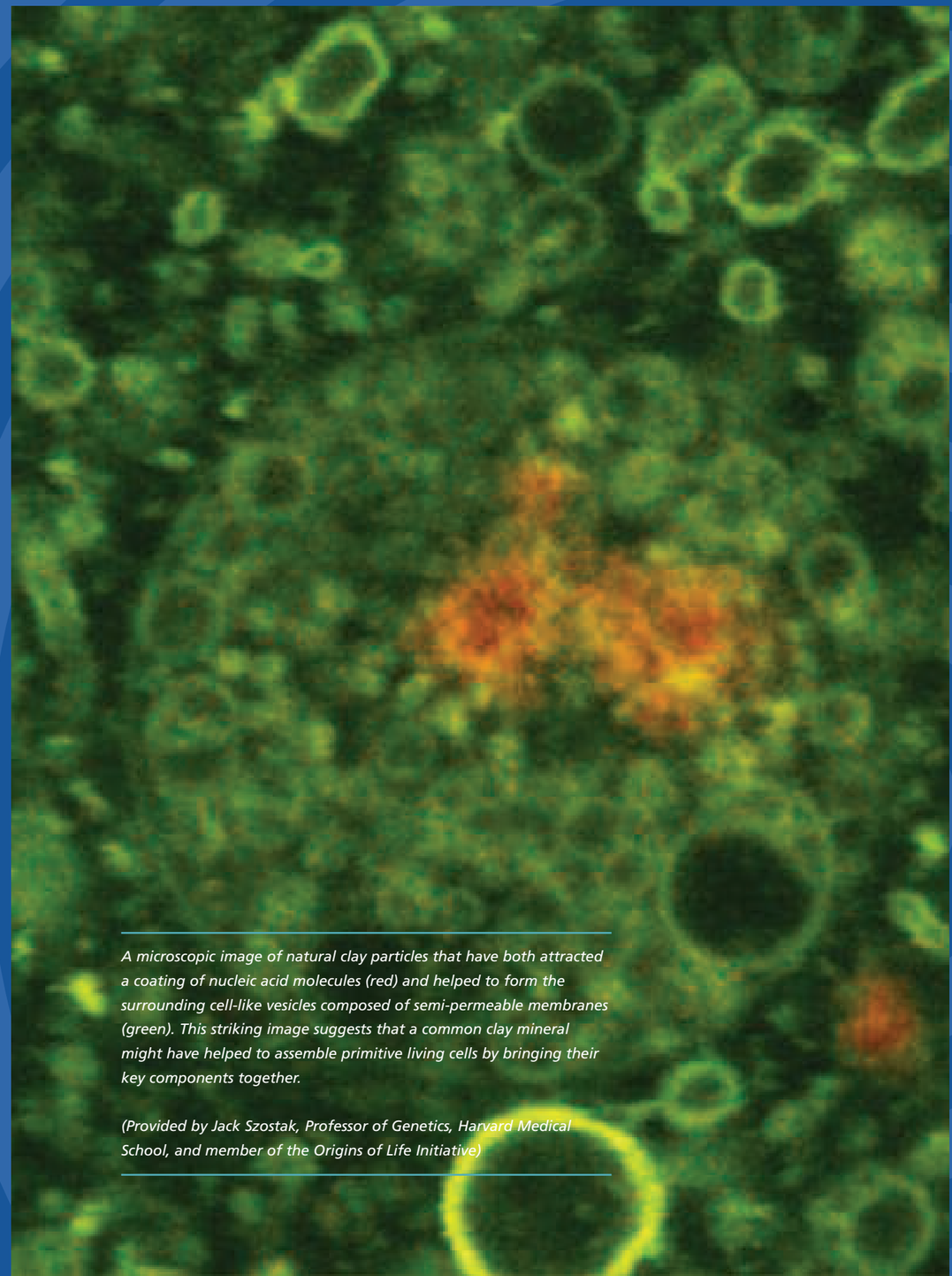
The Origins of Life in the Universe Initiative at Harvard University envisions the creation of an interdisciplinary center unlike any other in the world. The center will form a natural bridge between the physical and life sciences and become a focus for integrative undergraduate science education at Harvard. This vital hub of interdisciplinary scientific enterprise will create a community of students and faculty engaged in the field across departmental boundaries.

RECENT ACTIVITY IN ORIGINS OF LIFE AT HARVARD

- The Provost and Divisional Deans launched the Origins of Life Initiative in May 2006.
- The first Origins of Life retreat took place in May 2006 in Cambridge, bringing together 100 faculty, students, and post-doctoral fellows. Teams of Origins of Life researchers presented recent findings at the meeting.
- Currently, the Origins of Life Initiative is preparing to welcome its second cohort of Harvard undergraduates. Seed money from Harvard's Office of the Provost will enable six undergraduates to intern with Origins faculty every summer.
- The first Origins of Life Core course, "Life as a Planetary Phenomenon," debuted this spring semester.
- The Origins of Life Initiative recently equipped its Extraterrestrial Samples facility to receive particles from comet Wild-2, collected this spring by NASA's Stardust mission. The Origins of Life team is now set to study the composition and organic chemistry of these particles in detail.
- The Origins of Life Initiative has prepared plans for three laboratory facilities to form its backbone: Prebiotic Chemistry facility, Extraterrestrial Samples facility, and New Earths facility.

ORIGINS OF LIFE INITIATIVE DIRECTOR

Dimitar Sasselov, Professor of Astronomy, Faculty of Arts and Sciences



A microscopic image of natural clay particles that have both attracted a coating of nucleic acid molecules (red) and helped to form the surrounding cell-like vesicles composed of semi-permeable membranes (green). This striking image suggests that a common clay mineral might have helped to assemble primitive living cells by bringing their key components together.

(Provided by Jack Szostak, Professor of Genetics, Harvard Medical School, and member of the Origins of Life Initiative)