Background Sheet

HISTORY OF ASU’S SCHOOL OF EARTH AND SPACE EXPLORATION

Launched in July, 2006, the School of Earth and Space Exploration (SESE – pronounced ‘see-see’) developed from two strong traditions at Arizona State University: the geological sciences and the area of science focusing on astronomy, astrophysics and cosmology. Traditionally, research and educational activities in the earth sciences and planetary science at ASU were the focus in the geology department, while those activities in observational astronomy, cosmology, and computational astrophysics were focused on in the physics and astronomy department.

In the early years of the 21st Century, faculty in these programs proposed a new experiment in earth and space sciences: a unique academic environment in which scientific discovery motivates the exploration of today, technological innovation enables the discoveries of tomorrow, and transdisciplinary learning prepares future generations of explorers. This vision involved the creation of a new school that would employ many new faculty in both science and engineering and included earth and space science faculty from the old department of geological sciences and the astronomers, astrophysicists, and cosmologists from the department of physics and astronomy. After the merger, the former department of physics and astronomy became the department of physics.

The Arizona Board of Regents approved academic degree programs for the new school in 2006. SESE became an academic unit of ASU in July 2006, with Kip Hodges as its founding director. At that time, the department of geological sciences ceased to exist, and the department of physics and astronomy became the department of physics.

EXPLORATION

The word “exploration” in our name is indicative of our approach; it is the common thread that links all of our activities. For centuries, the quest for scientific knowledge has been an important driver for human exploration and SESE is dedicated to expanding the frontiers of knowledge through the exploration of Earth, space, matter, time and life. We explore space from the subatomic scale to distances measured in light years. We explore time ranging from billions of years to femtoseconds. Through theory, we explore how these dimensions collapse into the manifold of spacetime. But most important of all, we explore another dimension – possibility.

Increasingly, successful exploration depends on a mastery of engineering theory and practice to create and adapt technologies for scientific applications. Our research and educational programs are designed explicitly to emphasize the importance of technology in modern science.

Our newest degree program is the revolutionary BS in Earth and Space Exploration, the only such program of its kind. This degree emphasizes problem solving through the integration of engineering and science.
Today, SESE is a vibrant community of 56 faculty, more than 120 research scientists and postdoctoral scholars, ~100 graduate students, and ~200 undergraduates supported by an administrative and operations staff of more than 20.

The SESE community is engaged in a broad research portfolio including observational, computational, experimental, and theoretical projects. Our total research volume (as measured in annual awards) is rising rapidly and crested the $24M mark in FY2011. Major funding sources include the National Science Foundation, the National Aeronautics and Space Administration, the National Institutes of Health, and various private companies and foundations. SESE researchers conduct field work on every continent on Earth; they send probes to the Moon, Mars, Venus, and Mercury; and they employ ground-based and orbiting telescopes to interrogate deep space.

We offer both B.S. and B.A. undergraduate degrees as well as graduate degrees. Annually we expose nearly 3,000 undergraduate students to the earth and space sciences through our introductory subjects. SESE is currently the only school in the world offering a B.S. in Earth and Space Exploration. Within this degree are four concentrations: Astrobiology and Biogeoscience, Astrophysics, Exploration Systems Design, and Geological Sciences.

Our newest degree is the B.A. in Earth and Environmental Studies, which provides a foundational understanding of the evolution of the Earth system with an emphasis on the planetary context for sustainable human societies to prepare graduates for “green” professional careers.

The school also offers a B.S. in Aerospace Engineering with Astronautics concentration (in collaboration with the department of mechanical and aerospace engineering in the Fulton Schools of Engineering), and a B.A.E. in Earth and Space Education (in collaboration with the School of Education).

At the graduate level, we offer two master’s degrees: one in geological sciences and the other in astrophysics, as well as doctoral degrees in geological sciences and astrophysics.
SESE TOMORROW

SESE is growing at a pace that is unprecedented in the recent history of academic earth and space science. This growth has been accommodated, in part, by the construction of a new research building, Interdisciplinary Science and Technology Building IV (ISTB4), which is currently the largest research facility in the history of ASU. As the new home of SESE, ISTB4 is designed in an entirely novel way that reflects the school’s dedication to K-12 education and public outreach.

SCIENCE LITERACY

There exists an urgent need to educate an American work force that is technically expert, scientifically comprehensive, and socially aware in order to sustain our national excellence in a future increasingly based on technologically complex systems. We are driving the change to address this need by training the next generation of explorers who are hybrid scientist-engineers capable of asking the fundamental questions that lead to great discoveries and of designing the instruments to answer those questions.

But it is not only the minds of our students that we seek to engage. A scientifically savvy citizenry is required to endorse and support future exploration efforts. Through a variety of informal science education and outreach activities both the general public and K-12 students are being engaged and educated.

The first and second floors of ISTB4 are largely devoted to the integration of cutting-edge research in earth and space sciences with public education. The Gallery of Earth and Space Exploration, roughly 4,300 square feet of the first floor, is dedicated to interactive exhibits that engage visitors in the history of scientific exploration and invite them to contemplate future voyages of discovery. The space is outfitted with kiosk-style exhibits and large-format, high-definition monitors that display video from earth-observing satellites and robotic probes of other worlds.

The second floor hosts a variety of learning spaces for K-12 students and educators. The Learning Laboratory, a technology-mediated classroom focused on active learning, stimulates discovery and exploration of earth and space science concepts through hands-on experiments and problem-solving exercises. The Educator’s Workshop facilitates the creation, prototyping, and propagation of new pedagogies to enhance K-12 science learning.

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