

Mission

Biosphere 2 advances our understanding of natural and human-made ecosystems through integrated research and development of scalable interventions that increase the resilience and sustainability of Earth systems and human societies. We foster research in our unique facilities, conduct interdisciplinary science education, and lead in developing solutions for our planet and beyond.

Vision

By 2030, Biosphere 2 will be a global center for resilience solutions to humanity's grand challenges of climate change, biodiversity loss, and sustainable development. We will be a collaborative and inclusive hub in a network that provides education, ideas, research and innovations for sustainability from the University of Arizona campus to the entire globe.

To learn more about the benefits of the UArizona Biosphere 2 Industry Affiliates Program, please email Joaquin Ruiz at jruiz@arizona.edu



THE UNIVERSITY OF ARIZONA
Biosphere 2

Biosphere2.org
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UArizona Biosphere 2 Industry Affiliates Program



THE UNIVERSITY OF ARIZONA
Biosphere 2



The University of Arizona Biosphere 2 Industry Affiliates Program offers unique collaboration opportunities for both the UArizona and its industry partners, including the potential for research testbeds for rapidly advancing prototype and product development. As an Affiliate, you will access all these benefits:

- **Connect** with Biosphere 2 researchers, faculty and technicians-operators.
- **Join** host Joaquin Ruiz at our Affiliates' annual meeting of industry and university leadership at Biosphere 2.
- **Explore** expanded industry access at UArizona.
- **Participate** in Affiliate workshops and guest presentations.
- **Connect** to UA leadership for meaningful dialog.
- **Use** Biosphere 2 facilities for multi-day and overnight conferences, meetings and tours.
- **Add** your name to the Founders Naming Circle.

We invite you to become a member of the UArizona Biosphere 2 Industry Affiliates Program and contribute to an unparalleled environment where ideas, talent, and experiences are shared for the benefit of all.

Dr. Joaquin Ruiz

Director, Biosphere 2
Endowed Chair, Thomas R. Brown

The Future of Food

The University of Arizona and Biosphere 2 have pioneered a multi-pronged approach to the advancement of food security.

Biosphere 2 is investigating the advancement and integration of new agricultural practices to optimize the output of these systems. Many of these novel approaches lead to increased renewable energy production, increased food production, and reduced water use. Biosphere 2 is breaking the boundaries of food production, increasing food safety and security by integrating traditional and technologically advanced grow environments into systems.



A multi-pronged approach is necessary if we are going to reduce the carbon emission of agricultural production and its transport, improve the nutritional value of the crops, and increase the accessibility of the food to communities.

Our goal is to create “circular economic” structures, leveraging and integrating new facility into existing programming to enhance student/community engagement, alternative curriculum, and research and development. Biosphere 2, with its one-of-a-kind mesoscale structure, surpasses traditional laboratories in providing a place that enables this research.

Quality of Life on Earth and Beyond

Biosphere 2 research is addressing sustainability challenges both here on Earth and in the extreme environments of space.

For over 50 years, a wide range of experiments in closed ecosystems have been conducted by governments, universities, and private organizations — including the original Biosphere 2 mission in the 1990s. The intent of these studies was to learn the minimum complexity required to sustain human life for long-duration, off-world missions.

Insights from these studies will foster improved quality of life on Earth and pave the way for sustained human exploration of our solar system.



Today, Biosphere 2 is building programs to understand, given modern technologies and scientific knowledge:

1. the transition from physicochemical (mechanical) to bioregenerative (plant-based) environmental control and life support systems, and the continuously shifting balance of these two systems as humans enter and exit, and crops are planted, consumed, and harvested;
2. the transformation of simulated regolith (crushed basalt) to fertile soil; and
3. a study of the evolution of the microbial community of a transitional, hermetically sealed space occupied by both humans and plants.

Ecosystems Services

Biosphere 2 offers a transformational platform to address the grand challenges of science.

Current research at UA Biosphere 2 focuses on the global environment using a multidisciplinary approach, providing an essential link between the laboratory and the real world. This science program is transformational and tackles climate and biodiversity crises while focusing on three grand challenges in science:

1. integrating multiple disciplines (e.g., hydrology, ecology, geology, chemistry, and atmospheric sciences);
2. applying instrumental calibration to understand and model mesoscale systems and adaptable biological systems; and
3. developing an understanding of how complex Earth systems operate spatially and temporally.

The University of Arizona Biosphere 2 is uniquely able to develop a mechanistic understanding of how the atmosphere is influenced by the geo-biosphere and vice versa.

