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EDITORIAL OPEN

Welcome statement—*npj Microgravity*

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Several landmark events have occurred in the past few years that have enabled tremendous advances in spaceflight research. First, the International Space Station has been completed, providing an unprecedented internationally available laboratory (a portion of which has been designated as a US National Laboratory), which is currently being outfitted with an array of sophisticated equipment to accomplish long- and short-duration research in a variety of scientific fields, including life sciences, astronomy, physics, material sciences, observational sciences, astrobiology, and biochemistry. Second, the rapidly growing commercial spaceflight sector is beginning to expand both with National Aeronautics and Space Administration (NASA)-associated and independent missions. These companies are seeking robust avenues to promote their current and develop new research capabilities. Finally, several countries, including China, Israel, and India, have begun developing their own spaceflight programs and investing heavily in spaceflight research. Collectively, these events are dramatically increasing the quantity and quality of both spaceflight scientific experiments and spaceflight analogue studies on Earth.

To provide scientists and science enthusiasts alike with a way to stay at the vanguard of the latest cutting-edge research findings in this rapidly emerging field, we designed *npj Microgravity* as a stringently peer-reviewed platform dedicated to publishing the most important scientific advances applicable to a diverse readership. Indeed, *npj Microgravity* is a truly cross-disciplinary, open-access journal that serves as a novel platform for scientific exchange by capturing the discoveries made not only in the reduced gravity environment of spaceflight, but also in the normal gravity of Earth using spaceflight analogue systems. The scope of this journal reflects the research focus outlined in the National Research Councils' recommendations to NASA, *Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era*, by covering 'research that enables space exploration' and 'research enabled by access to space.' This includes both true spaceflight research and studies using a myriad of spaceflight analogue systems on Earth, including unique suspension cell culture systems, bed-rest studies, drop towers, parabolic flight, and closed habitats.

Microgravity is an extreme environment in which gravity is greatly reduced. As with studies in other extreme environments, research in spaceflight and ground-based spaceflight analogue systems provides a unique opportunity not only to enhance future spaceflight exploration missions but also to provide novel insight to advance our understanding of biological, physical, and engineering sciences on Earth with practical applications to benefit the general public, in ways that cannot be achieved using traditional experimental approaches. In this regard, spaceflight and spaceflight analogue research has already led to major advances in science and technology, impacting diverse areas including human health, performance, and disease prevention; animal, plant and microbial research; physics, materials, and combustion sciences; Earth observations; instrumentation; and human exploration—all of which have had a lasting impact on our global scientific capabilities and economic competitiveness.

With the International Space Station, commercial spaceflight entities, and increasing international participation from space-faring nations, we are in a Renaissance period for spaceflight research that has tremendous potential for breakthrough advances in diverse scientific and technological domains to benefit life on Earth and exploration of space. In common with other visionary commitments to support highly ambitious, innovative scientific endeavors that will expand the frontiers of human knowledge, successful utilization of the spaceflight platform holds the potential to ignite a paradigm shift to help solve major human challenges and initiate efficient partnerships among academia, government, and commercial sectors.

Our journal launch was enormously successful and featured multidisciplinary content from leading authors spanning the life sciences, physical sciences, and economics. Our featured article by Nusgens *et al.* reported findings from the longest animal experiment ever performed during spaceflight on mouse skin physiology. The authors found that skin (like bone, muscles, and the immune system) may be a target of weightlessness that could be detrimental for humans during long-duration spaceflight. Building on this remarkable start, we continue to release outstanding journal content in our latest and upcoming issues, which features prominent articles covering the effect of spaceflight and spaceflight analogue environments on stem cell differentiation, the human immune system, protein crystallization, and phase-change materials.

I encourage readers to *sign up for journal e-alerts*, as that is your best source for the latest news on *npj Microgravity*. In addition, look for an upcoming announcement of an exciting new interactive community site for *npj Microgravity* that will soon be launched.

As the Editor-in-Chief of *npj Microgravity*, I am delighted to be a part of this new cross-disciplinary initiative, which I believe is exactly the type of platform needed to highlight and broaden microgravity and ground-based microgravity analogue research into widespread mainstream acceptance with the highest values of scientific integrity historically defined by the *Nature* brand.

COMPETING INTERESTS

The author is Editor-in-Chief of *npj Microgravity* and is an employee of Arizona State University (ASU). Her research is also funded by the National Aeronautics and Space Administration (NASA). Both ASU and NASA are funding sponsors of this journal.

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