



## OPPORTUNITY

8

SCOPE WITHIN REACH

## UNCERTAINTIES

Values, Collaboration

## MEGATRENDS

Advanced Health and Nutrition

## TRENDS

Cross-sectoral Partnerships  
Future of Space  
International Collaboration  
Longevity & Vitality  
Mental Health

## SECTORS IMPACTED

Communication Technologies & Systems  
Consumer Goods, Services & Retail  
Cyber & Information Security  
Data Science, AI & Machine Learning  
Digital Goods & Services  
Education  
Government Services  
Health & Healthcare  
Immersive Technologies  
Insurance & Reinsurance  
Art, Media & Entertainment  
Metals & Mining  
Professional Services  
Real Estate  
Travel & Tourism  
Utilities

What if we used lessons from space to better handle loneliness on Earth?

# ORBITING FOR ANSWERS

A global consortium of interdisciplinary experts – academics, clinical psychologists, space psychologists, and neuroscientists – bridge insights from astronaut isolation and space habitat studies to enhance understanding and management of loneliness on Earth, contributing to mental healthcare advances on Earth.





## WHY IT MATTERS TODAY



### Loneliness negatively affects well-being

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Loneliness negatively affects well-being<sup>317</sup> and is associated with an increased risk of various health issues, such as deteriorating heart health, dementia, and early death.<sup>318</sup>

While loneliness and social isolation rates differ globally and across racial, ethnic, and social groups, they are of concern.<sup>319</sup> In adolescents, Southeast Asia reports the lowest rates,<sup>320</sup> while the eastern Mediterranean has the highest rates. Eastern Europeans experience more loneliness than people from northern Europe.<sup>321</sup> In Australia, 34% of adults are lonely and in the United States, 43% lack companionship, feel their relationships lack meaning, or feel isolated.<sup>322</sup>

Emotional regulation, along with preventing and managing depression and anxiety, is critical for astronaut mental health and mission success.<sup>323</sup> Isolation and monotony in space, coupled with a confined environment, pose risks to astronauts' well-being leading to symptoms like fatigue and sleep disturbance; spacecraft features, including light, noise, and temperature, also impact on mental health.<sup>324</sup> NASA's Human Research Program lists seven aspects vital for optimal psychological health and assists astronauts in managing stress and challenging scenarios.<sup>325</sup> Its extended research and technology development impacts on both mission success and astronauts' health post-mission.<sup>326</sup>

From the artificial intelligence tool iVOICE from the Centre for Space Medicine at University College London, which detects astronaut fatigue, to a toolkit for space psychologists that uses strategies from various isolated professions to combat loneliness and stress,<sup>327</sup> tackling loneliness in space is vital before, during, and after space missions. Efforts are already underway to simulate and study life during a Mars mission through NASA's Crew Health and Performance Exploration Analog habitat.<sup>328</sup>



## OPPORTUNITY

The field of aerospace research has the potential to usher in a new frontier in the realm of mental health advances. A global consortium for space–Earth loneliness research, composed of an interdisciplinary group of academic researchers, clinical psychologists, space psychologists, and neuroscientists, could expand understanding of loneliness by bridging research on loneliness in space and on Earth.

Researchers unpack the experiences of astronauts enduring prolonged periods of isolation on the International Space Station and during space travel,<sup>329</sup> cross-examining them with environmental factors like noise, lighting, air quality, nature, privacy,<sup>330</sup> social interactions, and other factors that contribute to issues such as anxiety, depression, and stress, which are already well documented on Earth.<sup>331</sup> This would offer insights into managing loneliness on Earth. For example, resilience-building exercises that astronauts use to withstand the psychological pressures of space, such as stress management techniques and cognitive-behavioural strategies, could be integrated into mental health practitioners’ treatment efforts.

## BENEFITS

Integrating mental health insights from space exploration with research on Earth innovatively addresses loneliness, enhancing social cohesion and boosting productivity and well-being.

## RISKS

Translating space-based mental health solutions to Earth’s varied cultural, social, and economic settings is challenging. It may not fully address the social stigma associated with loneliness or replicate space research conditions.



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