

# Avoiding deep impact: UCF, NASA study spaceship teamwork

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Visiting Mars in 2030 is going to take some engineering ingenuity, but making sure astronauts make the long, cramped journey without driving each other crazy is going to be just as tricky.

It's estimated that a round trip to Mars will take at least two years. That's why NASA is investing millions of dollars trying to figure out the right recipe for creating highly effective, collaborative teams that can troubleshoot themselves out of any problem. The [space agency](#) is investigating the role leadership plays in such dynamic groups, as well.

For the past several years several experts on teamwork have been helping NASA with that question. This month, several University of Central experts earned more than \$1.2 million to continue their work as NASA looks to prepare its workforce of the future.

"We are looking for ways to identify key social and task-oriented roles on long-duration missions," said Eduardo Salas, a psychologist and the lead investigator for the NASA Human Research Program grant.

"Generally, we know you want people on a team who are emotionally stable, extroverts, catalysts. But by the end of this three-year study we hope to have a taxonomy to allow NASA to select or compose teams according to desirable social roles."

Seems like common sense, but difficult to deliver. Everyone who has co-workers knows how a disagreement or clash of personalities can create a nightmare work environment that is depressing and demoralizing if not

handled correctly. From a business point of view, that kind of conflict can lead to distractions that take away from productivity and cost the company money.

And unlike most office environments, a clash between astronauts could result in dire consequences for the entire crew. And unlike missions to the moon or the International Space Station, where astronauts can call Houston to help solve a problem, that won't be so easy on long missions when the communication lag is expected to be 20 minutes each way to and from Earth.

"There's not a lot of hard science yet with respect to team dynamics in long-duration exploration missions," Salas said. "There are several groups working on it. We've been doing it for a while with other teams as well. But we hope to have a good foundation by the time we finish our study."

Salas is a trustee chair and Pegasus professor of psychology at UCF. He also holds an appointment as program director for the Human Systems Integration Research Department at the university's Institute for Simulation & Training (IST). His co-investigators on this grant are Stephen Fiore, director of the Cognitive Sciences Laboratory at IST and an associate professor of cognitive sciences in the philosophy department, and James Driskell, a social psychologist with Florida Maxima Corp. in Winter Park.

To compliment Salas' work, NASA awarded a \$100,000 grant to associate professor of research Shawn Burke so she can look at the role leadership plays in dynamic and stressful environments. Burke works next door to Salas at IST and is also a co-investigator on Salas' new grant.

"Complex environments, especially like those seen in long-duration

exploration mission, will require more autonomous teams," Burke said. "So we need to identify the challenges to leadership in such environments and the most effective forms of leadership to combat the challenges. That's what I'm looking at."

Burke will review behavioral data from NASA experiments conducted in remote environments that are designed with many of the same characteristics expected as long duration space flight. Archival documentation from other teams that work in isolated and extreme environments (oil rigs, Antarctic exploration, firefighting, military) will be examined to look for clues. Interviews with astronauts and key NASA personnel will also be conducted in an effort to gain their perspective and learn from their experience.

Burke earned her Masters and Doctorate degrees in Industrial/Organizational psychology from George Mason University. Her areas of expertise are team dynamics and leadership roles. She's been at IST since 2000 and was a research fellow at the U.S. Army Research Institute before that. She's published more than 80 journal articles and book chapters related to teams and leadership and has presented at more than 100 conferences.

Burke's co-investigators on this project are Salas and Marissa Shuffler, an assistant professor of industrial/organization psychology at Clemson University and a UCF alumnae.

Salas and Burke will also likely bump into each other in Houston when they travel to Houston as part of their grants to visit NASA's research facility that focuses on behavioral health and performance. The facility mimics some of the isolated and harsh conditions astronauts are likely to encounter, which should aid researchers.

The conclusion of UCF studies will not only help NASA, but may also

help companies and organizations that work in extreme environments on earth, such as oilrigs and the military.

The UCF teams were selected from 123 proposals. NASA awarded \$17 million in grants to 26 projects from 16 institutions in eight states.

UCF has a long history working with NASA, from helping it develop hardware to take accurate color pictures of the Mars surface to groundbreaking work on teamwork conducted by Salas and psychologist Kimberly Smith-Jentsch, who runs the Team Training and Workforce Development Lab in UCF's psychology department.

Provided by University of Central Florida

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