

In This Issue



At the NASA Project Management Challenge in Galveston, Texas, this past February, Jean-Jacques Dordain, director general of the European Space Agency, predicted that global collaboration will define future space exploration. Only a joint effort can tackle the immense technical and economic challenges of extending our reach in space. Part of Dordain's speech appears in this issue of *ASK* ("Space Exploration in the 21st Century"), and other articles here deal directly with international cooperation or with the related issues of broadening the search for critical expertise and building the trust and understanding diverse teams need to work together successfully.

In the interview, William Gerstenmaier reflects on the development of the International Space Station, the premier example of multination collaboration in space. He talks about the long working relationship that has made it possible for the United States and Russia to cooperate effectively in times of crisis and of the value of partners taking different approaches to the same technical challenge. These different ways of looking at a problem help create the "requisite variety" that Laurence Prusak identifies as essential to a robust organization or project in "The Knowledge Notebook." Prusak argues strenuously against "going it alone." He says that organizations can thrive in this complex, changing world only by welcoming knowledge from many sources.

Ed Hoffman's "From the APPEL Director" column brings together the themes of international cooperation and trends in project management. He emphasizes the importance of cognitive, cultural, and geographic diversity in carrying out demanding projects. NASA's Astrobiology Institute ("Are We Alone?") is an outstanding example. The study of potential extraterrestrial life necessarily involves many scientific disciplines. The institute uses cross-training classes, face-to-face conferences, strategic-planning workshops, and videoconferencing technology to support worldwide astrobiology collaboration and provides grants to help

educate the next generation of astrobiologists. The challenge in creating the kinds of teams that Hoffman describes, and the astrobiology work exemplifies, is to develop teams that have enough cohesion to work well together without undermining the diversity of perspective and experience that makes them creative and flexible.

In "Petrobras and the Power of Stories," Alexandre Korowajczuk and Andrea Coelho Farias Almeida look at the issue of creating cohesion and sharing rich knowledge from a somewhat different angle. The Brazilian energy company is carrying out a major storytelling initiative to teach thousands of new employees about the organization's values and culture as well as the real-life expertise needed to carry out the company's operations. Hearing the stories—usually in the presence of veterans who lived them—communicates subtle knowledge that could never be conveyed through manuals or memos.

One way NASA has sought new ideas from diverse sources in recent years is by sponsoring the Centennial Challenges program, which offers an open invitation to individuals and groups to undertake technical challenges ranging from designing a better spacesuit glove to building a robotic lunar-soil excavator ("Open-Door Innovation," by Andrew Petro). Even the entries that do not win prizes sometimes demonstrate surprising, potentially valuable new technologies. Many of the competitions—the glove and excavator, and the lunar lander and power-beaming challenges—are inspiring new ideas that will undoubtedly contribute to future space exploration.

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