

## From the Director

# Thinking About Excellence

BY ED HOFFMAN



We talk a lot about “excellence” at NASA. That’s no surprise. Our mission calls on us to create and manage complex, innovative technologies with little margin for error. Failure can mean the loss of missions costing years of work and many millions of dollars and sometimes the devastating loss of life. So excellence in what we do is not just desirable; it’s required. I’d like to reflect a little here on what excellence is and how it develops.

Most of us believe we recognize excellence when we see it. We can probably agree on a definition, something along the lines of “superior quality or performance produced by outstanding knowledge and skill.” That’s a good start, but I think looking further can provide clues about how to achieve and maintain excellence in our work at NASA.

People who excel usually start out with a basic aptitude for whatever it is they become expert in, but a lot of learning goes into achieving excellence. Initially, that means formal education, studying the basics and then the depth and subtleties of a field. Schooling alone doesn’t produce excellence, though. Even the most promising newcomers need the learning that comes from long experience before they become experts who excel in their work. In fact, “expert” and “experience” (and “experiment”) come from the same Latin word, *experiri*, which means “to put to the test.” Excellence can only be achieved by testing, extending, and refining “book learning” day by day through the experience of real work.

Having experience is not enough, of course. You have to learn from it, and learning from experience depends on a couple of things. First, you have to be willing to recognize and admit mistakes quickly, to learn from what goes wrong.

(To make that happen, your organization also needs to treat mistakes as learning opportunities rather than opportunities for punishment.) Second, you have to reflect on experience. Some of that reflection is personal; excellence means continuously striving to understand what your work experience is telling you. Some is more public. At NASA, this magazine and APPEL’s Masters Forums are among the ways that people share what they learn from experience. Possibly the most valuable reflection happens in teams and groups that work together. That is why some organizations have adopted the Army’s after-action review process, which gives groups an opportunity to compare what they expected to happen to what really happened in an event or project and talk about what they learned. NASA’s demanding schedules and tight budget make it hard to find time for group reflection, but I think there is no denying its importance.

We sometimes associate excellence with individuals—the talented surgeon, the outstanding engineer—but when work is complicated and collaborative, excellence depends more on how well a group works together than on the skill of any one person. In a study of surgeons who perform coronary bypass operations, Robert Huckman and Gary Pisano of Harvard Business School found that the success rate of surgeons who divided their time between two hospitals was significantly higher in the hospital where they performed more surgeries—that is, where they and their operating room team had the most shared experience. Their conclusion—that excellence depends more on the quality of teamwork than the talents of an individual “star”—is an important one for NASA. ●