

DIRECTOR'S NOTES

Sputnik at Forty

What an incredible forty years we have had in science and technology, thanks in no small measure to Sputnik. We were stunned when the Soviet Union successfully launched Sputnik on October 4, 1957, and exhilarated less than a dozen years later when, on July 20, 1969, an American landed on the moon. We might have reveled in the glory of it all and turned our attention away from space to other matters, for at the time there was no shortage of problems here on this planet. But we didn't.

Instead we created ever more sophisticated and powerful tools for exploring the universe, as we set our sights on Mars, Jupiter, Saturn, and beyond, on Venus and Mercury and the Sun itself, and even the itinerant comets. In four decades we have surely learned more about the solar system than we had in all of the past centuries put together. Nevertheless, we have tens of decades of exploration ahead of us. Moreover, thanks to modern information and communications technologies (for which, indirectly at least, Sputnik can claim some of the credit), ordinary citizens can be in on the adventure as it happens, day by day. It is as though Columbus, say, or Lewis and Clark, had been able to send back video accounts for us to watch on the nightly news or download from the Web.

A NEW FRONTIER

The story is much the same in astronomy as a whole. Sputnik ushered in a forty-year period of sustained and stunning progress that has radically changed our understanding of the size, make-up, history, and behavior of the physical universe. But the story is not the same in science education.

It is true that Sputnik provoked a huge increase in the education reform efforts that had begun a few years earlier. In higher education, the race to the moon stimulated the nation to produce the scientists and engineers who would assure U.S. dominance in space. In the schools—due largely to the National Sci-

ence Foundation and the National Defense Education Act—the development of new science and mathematics courses proceeded on a scale unprecedented in our history, as did the expansion of summer institutes and other opportunities for teachers to improve their knowledge and skills. In many ways it was a golden age in the history of science education, one that was exciting and productive.

A POWERFUL REMINDER

But reaching the moon was not followed, as in science, by an intensification and broadening of the science education reform effort. On the contrary, we acted as though the game was over and turned away from reform for nearly fifteen years. It wasn't until 1983, after losing many of the gains of the Sputnik years, that we were again goaded into action, this time by *A Nation at Risk* and concerns about our ability to compete in a global economy. While much has been accomplished in this most recent reform movement, imagine where we might be today if we had been as steadfast in seeking universal science literacy as we were in exploring the universe.

On its fortieth birthday, Sputnik can serve as a powerful reminder: If we are serious about reforming science education in our schools and colleges, we must be driven by long-term educational goals—by what we want all of our students to learn—not by the crisis of the decade. And because there are no simple solutions, we must be prepared to stick with the effort for a long time to come. Fifteen years, or twice fifteen, is simply not enough time to bring about significant and lasting changes in that vast, complicated, and incredibly disaggregated non-system called American education.

F. James Rutherford
Director

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