New Horizons: Completing the Initial Reconnaissance of the Solar System—Guest Editors' Introduction

Glen H. Fountain and Helene L. Winters

ABSTRACT

This issue of the Johns Hopkins APL Technical Digest*, "New Horizons: Completing the initial Reconnaissance of the Solar System," tells the story of the exploration of Pluto and the Kuiper Belt. It describes the history of New Horizons from conception through the flyby of Pluto and the Kuiper Belt object Arrokoth, as well as the scientific rationale for the mission. This discussion is followed by descriptions of the spacecraft and instruments; how the New Horizons team flew the mission across the solar system and then told the world about it; and a summary of the scientific results and possible future science investigations (subject to NASA approval) to study the outer heliosphere.*

The New Horizons mission is a great adventure, completing the initial reconnaissance of our solar system with the exploration of the Pluto system and the Kuiper Belt. This issue of the *Johns Hopkins APL Technical Digest* is devoted to a description of that mission from its conception to its implementation, including a summary of the scientific results.

The article by Stern and Krimigis discusses the beginnings of planetary exploration and the reasons for principal investigator–led missions such as New Horizons and tells the story of how the mission to Pluto and the Kuiper Belt went from an idea to reality. Articles by Hersman et al. and Fountain et al. describe the spacecraft and instruments, respectively, that have returned the bountiful harvest of novel science data. Articles by Bowman et al. and Holdridge et al. describe the process and teams that enabled New Horizons to fly across the solar system and, after 9.5 years and nearly 5 billion kilometers, to pass by Pluto at the desired point in space within 45 km and within 88 s of the desired time. The article by Weaver et al. summarizes the science and our new understanding of the Pluto system as well as the later even closer flyby of a Kuiper Belt object some 3.5 years later. Buckley et al. describe the engaging education and public outreach activities and highlight the worldwide public impact of this mission. New Horizons has the potential for much more data gathering to provide a better understanding of our heliosphere (the volume of space influenced by the Sun's solar wind). Brandt summarizes what New Horizons may be able to accomplish as it continues its voyage into this relatively unknown region. Lastly, we have included a short album of pictures that provide a glimpse of the wonderful team and the activities that made the mission a reality. This mission is the accomplishment of thousands of individuals and many organizations, not only at the principal institutions (APL and the Southwest Research Institute, or SwRI) but also at NASA, which has sponsored this effort, many other

organizations in the United States and other countries, and even some amateur astronomers.

We, as well as the various article authors and the larger New Horizons team, have been privileged to be a part of this great adventure, the completion of the initial reconnaissance of our solar system. We are part of a larger community of explorers who have gleaned a new understanding of the richness of our solar system and even the potential for life beyond Earth. A number of members of this community find these lines from a poem by T. S. Eliot have a resonance for what excites us:

We shall not cease from exploration
And the end of all our exploration
Will be to arrive where we started
And know the place for the first time.

Little Gidding, 1942

ACKNOWLEDGMENTS: Work on the New Horizons mission was performed under NASA contracts NAS5-97271/TO30 (APL) and NASW-02008 (SwRI).

Glen H. Fountain, Space Exploration Sector, Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Glen H. Fountain is a program manager in APL's Space Exploration Sector. He received a BS and an MS in electrical engineering from Kansas State University. During his early career, he was a member of teams that developed a number of space missions for both the Department of Defense and NASA. From 1974 on, he has held a number of line and project management positions in APL's Space Department (now Space Exploration Sector). From 2004 through 2015, he was the project manager of the New Horizons mission. He has been recognized for his work in various ways, among them the American Institute of Aeronautics and Astronautics (AIAA) Von Braun Award for outstanding space program management (2007), NASA Exceptional Public Service Medals (2008, 2016), and the Space X/AIAA Award for technical excellence (2015). His email address is glen.fountain@jhuapl.edu.

Helene L. Winters, Space Exploration Sector, Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Helene L. Winters is a program manager in APL's Space Exploration Sector. She has a BS in computer science from James Madison University and an MS in systems engineering from the Johns Hopkins University Whiting School of Engineering. She is the project manager on NASA's New Horizons and Parker Solar Probe missions and was previously the project manager on NASA's MErcury Surface, Space ENvironment, GEochemistry, and Ranging (MESSENGER) mission and on the Mini-RF instruments—one flying on NASA's Lunar Reconnaissance Orbiter (LRO) and one that flew on the Indian Space Research Organisation's Chandrayaan-1. She has held various other positions on national security and civil space projects and has also served in line management. Before coming to APL, she worked in design and development of training and simulation systems for Department of Defense applications. Her email address is helene.winters@jhuapl.edu.