

THE ILLUSTRATED GUIDE TO THE NEW HORIZONS FLYBY OF 2014 MU69. J. T. Keane¹, A. J. Verbiscer², J. W. Parker³, C. B. Olkin³, H. A. Weaver⁴, J. R. Spencer³, S. A. Stern³, and the New Horizons Science Team. ¹California Institute of Technology (Pasadena, CA 91125, USA, jkeane@caltech.edu), ²University of Virginia (Charlottesville, VA 22904, USA), ³Southwest Research Institute (1050 Walnut St., Suite 300, Boulder, CO 80302), ⁴Johns Hopkins University Applied Physics Laboratory (Laurel, MD 20723, USA).

Summary: As NASA's New Horizons spacecraft streamed back images from its January 1st, 2019 flyby of small Kuiper Belt object, (486958) 2014 MU₆₉ (henceforth "MU69"), it captured the imaginations of everyone involved—including scientists, engineers, and artists. Scientists and artists have long been a natural, mutually-beneficial pairing. As NASA missions are sent out into the solar system, artists are often critical for translating important results into products that can be readily consumed by both the public and other scientists. NASA-inspired artwork has shaped the popular conception of many solar system worlds—from Chesley Bonestell's depictions of Saturn's moons, to Bill Hartmann's paintings that grace the cover of so many University of Arizona Press textbooks [1]. Drawing is a fundamental scientific skill [2, 3]

I was brought onto the New Horizons science team in part for my skills in scientific illustrations [e.g., 4]. During the encounter, I was responsible for sketching new scientific results from the flyby—while also contributing my geophysics expertise [e.g., 5]. My artwork both facilitated discussions within the science team, and were utilized for press conferences and public engagement. This style of hand-drawn illustration was extremely useful, given the rapid cadence of scientific discoveries. Several other team members provided art during the flyby [e.g., 6, 8, 9].

In this work, I will present a collection of my original sketches and illustrations detailing the exploration of MU69. This collection includes: sketches done in the lead-up to encounter (centered primarily on the wildly successful occultation campaign); sketches done during the encounter week as MU69 transformed from a pinpoint into a fully-fledged, explored world; and sketches done after the encounter, as we received more data from New Horizons, and developed new hypotheses to explain the geology observed on MU69. The figures shown here contain some examples of this work.

References: [1] Miller, R. (2014) *The Art of Space*, Elephant Book company. [2] Vertesi, J. (2013) *Seeing Like a Rover: How Robots, Teams, and Images Craft Knowledge of Mars*, U. Chicago Press. [3] Kruhl, J. H. (2017) *Drawing Geological Structures*, Wiley-Blackwell. [4] Keane, J. T. (2018) LPSC 49, abstract #2981. [5] Keane, J. T. et al. (2019) LPSC 50. [6] Kinczyk, M. J. et al. (2019) LPSC 50. [7] Robbins, S. J. et al. (2019) LPSC 50. [8] Gabasova, L. et al. (2019) LPSC 50.

