EXHIBITING BENNU AT THE SMITHSONIAN NATIONAL MUSEUM OF NATURAL HISTORY. T.J. McCoy[1], C.M. Corrigan[1], N.G. Lunning[2], S.A. Eckley[3], C.J. Snead[2], C.J. Hoskin[1], K.C. Falquero[1], F.M. McCubbin[2] [1]Dept. of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0119, USA (mccoyt@si.edu), [2]NASA Johnson Space Center ARES Mail Code XI2 2101 NASA Parkway Houston, TX 77058-3696 USA. [3]Jacobs Technology, NASA Johnson Space Center, Houston, TX 77058-3696 USA.

Introduction: With the return of samples from asteroid Bennu by the OSIRIS-REx mission, the Smithsonian and NASA are continuing our mutual long-standing commitment to and collaboration on outreach with the first public display sample of Bennu. As the most visited museum complex in the United States, one free to the public, and home to the US National Meteorite Collection, the Smithsonian's National Museum of Natural History provides an ideal setting for the display of the first sample returned from the surface of a planetary body by a US mission in more than 50 years. This abstract details specimen selection, exhibit design, our social media campaign, the opening, and reaction to the exhibit.

The specimen: Discussions about displaying a sample began soon after sample collection on Bennu. With a global albedo of 4.4% [1], displaying a small sample of such a dark object would be challenging. Although it was determined that display samples would not have to maintain pristinity, minimizing atmospheric degradation remained a priority. The curation compliant containers selected by NASA JSC for all specimen storage, those that best minimize oxygen leakage [2,3], proved ideal for display. The stainless-steel container contrasted with the low albedo specimen and the high-quality glass lid allows lighting of the specimen, as discussed below.

Figure 1. Bennu sample OREX-800027-0 as displayed at the Smithsonian.

NASA committed a total of 0.5% of the returned sample for displays at the Smithsonian's National Museum of Natural History, Space Center Houston, and the University of Arizona Alfie Norville Gem & Mineral Museum. These specimens are separate from the science team allocation. The Smithsonian sample was selected by the JSC Curation Office in late October 2023, from samples extracted from the TAGSAM. Recognizing that surface area was more important than volume, NASA selected a 134 mg sample (OREX-800027-0) with dimensions of 7.9×5.6×4.5 mm. The sample was scanned by X-ray computed tomography prior to sealing in its container for transport to the Smithsonian and display (Fig. 1).

Case Design: The exhibit consisted of a single repurposed case at the entry off the main rotunda into the Moon, Meteorites and Solar System gallery of the Geology, Gems and Minerals Hall. The case was retrofit with power for a "spot" light on the specimen (Fig. 1). The specimen was intentionally exhibited in the lower half of the case, recognizing that many of our visitors are children. Entitled "A View of the Beginning" (Fig. 2), the case contextualizes Bennu as a key to understanding the earliest history of our Solar System and our planet. Although we typically avoid models in favor of specimens, models of the Atlas V rocket and OSIRIS-REx spacecraft, generously provided by United Launch Alliance and Lockheed-Martin, respectively, along with an artist's concept of OSIRIS-REx collecting samples on Bennu, provide context for a sample returned by spacecraft, rather than arriving as a meteorite. At the far end of this same gallery are Apollo samples, bookending 50+ years of sample collection by US missions.

Figure 2. Bennu exhibit case within the Moon, Meteorites, and Solar System gallery. Photo by James Di Loreto and Phillip R. Lee, Smithsonian Institution.

With limited text within the case, an accompanying ~3 minute video (Fig. 3) within the exhibit allows us to tell the story of Bennu in greater detail, using footage from the OSIRIS-REx encounter with Bennu and sample return and interviews, to further contextualize this sample and more fully address the scientific questions we hope to answer.

Figure 3. A single frame from the video that accompanies the Bennu exhibit. Note it is open captioned for those with hearing challenges.

Social Media Campaign: With the opening set for Nov. 3rd, a social media campaign began on Oct. 27th with short videos highlighting the upcoming opening and reinforcing the importance of the Bennu sample in the context of meteorites and the questions that have been historically and are currently posed about the origin of the Solar System and of our own planet and its unique features (abundant water and life, as well as the presence of silica-rich continents). This social media campaign included posts on Facebook, Instagram, and X (formerly Twitter), where they remain available for viewing. Even before the Bennu specific campaign, on Oct. 17th, our social media platforms highlighted the visit of OSIRIS-REx science team member Sir Brian May to the meteorite collection, building interest with nearly 1,000 likes/230 shares on Facebook and 4900 likes on Instagram.

The social media campaign concluded on Nov. 3, 2023, with a video of the case with the voice over of comments made by the first author of this abstract at the public opening. The video ends with the rotational CT scan done at JSC (Fig. 4), which was conducted too late for inclusion in the exhibit, but has been well-received since the case opening.

Public opening: Prior to the opening, a press release featuring quotes by Museum scientists, NMNH Director Kirk Johnson, and NASA Administrator, former US Senator, and astronaut Bill Nelson was circulated to generate interest. On Nov. 3, 2023, the senior author was joined by Smithsonian Undersecretary for Science Ellen Stofan, a distinguished planetary scientist, and Administrator Nelson. Robust press coverage included national and international outlets such as CNN, C-SPAN and Reuters, special interest media like Space.com, as well as local television and print outlets.

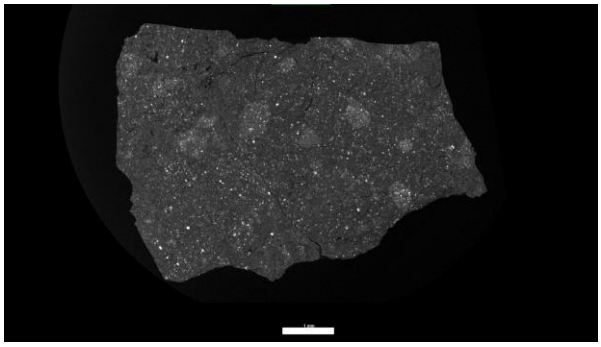

Figure 4. Single frame from the X-ray CT scan of OREX-800027-0 with prominent brecciated texture.

Reaction to the Exhibit: Although too early to gauge the impact of the exhibit on the public, informal indications are that the exhibit has been well-received. School groups are already incorporating locating the Bennu exhibit as part of their tour of the Museum. On the afternoon the exhibit opened to the public, a visitor noticing the rocket and spacecraft models commented that he couldn't wait for the day, presumably months in the future, when a sample of Bennu would be available for public viewing. Informed that the future is today, and samples were available for viewing less than 6 weeks after arriving on Earth, he commented that he couldn't believe we managed to open an exhibit with a sample of Bennu less than six weeks after the sample arrived on Earth. The fact that we did so reflects the importance NASA and the Smithsonian place on sharing science and exploration with the public.

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References: [1] DellaGiustina D.N. et al. (2020) Science 370, eabc3660.[2] Montoya M. et al. (2023) 86th MetSoc, #6050. [3] Snead C.J. (2022) Hayabusa 2022 Symposium, #P-01.