



The Arch Mission Foundation Announces Digital Data Stored in DNA added to Lunar Library™, Creating Groundbreaking Archive of Knowledge on the Moon

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Partners for this ambitious effort include Microsoft, Twist Bioscience Corporation, and the University of Washington

LOS ANGELES, CA, September 27, 2018 —The Arch Mission Foundation today announced the creation of an archive of knowledge encoded into synthetic DNA by Microsoft, Twist Bioscience Corporation, and the University of Washington to be included in the Lunar Library™. The DNA Archive will feature 10,000 crowdsourced images and the full text of 20 important books, among other items. The data is encoded into billions of synthetic DNA molecules and encapsulated for long-term preservation. Collectively this data will represent the first Special Collection of the Lunar Library, which the Arch Mission Foundation announced last spring.

The Arch Mission Foundation sought partners that could help curate these materials and assist in achieving a remarkable collection that reflects both the best of human knowledge, as well as the most ambitious technical abilities in the emerging new field of molecular data storage. Molecular data storage is a new technology for storing and retrieving data from molecules of synthetic, non-living DNA.

Microsoft and the University of Washington created the Molecular Information Systems Laboratory (MISL) to study how biology can be used to benefit the IT industry. The DNA data storage project is the first effort of its kind undertaken by the MISL team. They have encoded in DNA a book collection composed of 20 public domain titles sourced from the Project Gutenberg library and verified the information can be recovered with no bit errors. They are now working on creating a photo collection to be encoded in DNA as part of their "Memories in DNA" project, which encourages people to share images they wish to remember forever that MISL researchers will preserve in synthetic DNA.

Members of the public can contribute their own images to the Lunar Library by submitting them at <http://memoriesindna.com> or by emailing an attachment to lunarlibrary@memoriesindna.com. For this project, Twist Bioscience is synthesizing the DNA molecules.

The Arch Mission Foundation is designing a special payload to contain and protect this material for long-term backup on the Moon and plans to add other important DNA to the archive in the future.

"We aim to build the largest library in DNA ever, and it will continue to get larger as our capacity grows toward petabyte scale in the future. We're proud that this addition to the Lunar Library - our first Special Collection - builds on our mission of preserving data by safeguarding both classic works and precious memories," said Nova Spivack, co-founder of the Arch Mission Foundation. "This data is an exciting beginning to our Lunar Library Special Collections and a worthwhile continuation of Arch's mission to lead new frontiers of data preservation."

The Arch Mission Foundation is a non-profit corporation designed to continuously preserve and disseminate humanity's most important knowledge across time and space. As the builder, designer, and distributor of curated long-term archives, called Arch Libraries, the Arch Mission is leading the preservation of human knowledge across the universe. Arch Libraries are the longest-lasting records of human civilization ever created. Earlier this year, the Foundation announced the creation of the Lunar Library, which will place Wikipedia and other archival information on the Moon in 2020. These endeavors are part of the Arch Mission's vision to preserve information for the benefit of future generations.

DNA is a useful vehicle for storing big data and allows for large quantities of knowledge to be encoded at molecular scale on relatively small objects. DNA can potentially store exabytes of data in a cubic inch-sized volume. Another advantage of using DNA for big data storage is that once it is written, it takes up very little physical space and can be easily and inexpensively replicated billions of times. This data can be read in the distant future by recipients who have the necessary equipment to sequence DNA. The Arch Mission will include instructions on how to sequence DNA and access the knowledge on this DNA in the payload portions of the Arch. The project as a whole represents a new milestone in these technologies, as the Special Collection aims to contain the largest amount of data ever written into synthetic DNA.

Partner Quotes

"At Twist, we believe in using the unparalleled potential of DNA to enable those with unique and important visions to think beyond the bounds of the world we know today," said Bill Peck, Chief Technology Officer of Twist Bioscience Corporation. "That's why we were so excited to support Arch Mission with our disruptive silicon-based DNA synthesis platform and synthetic DNA tools. This project pushes the bounds of DNA storage, bringing secure and efficient data storage into a new age."

"Microsoft's mission is to empower every person and every organization on the planet to achieve more. Collaborating with the Arch Mission Foundation on the Lunar Library is a natural extension of that mission beyond planetary boundaries," said Karin Strauss, Senior Researcher at Microsoft. "With this collaboration, we show the value of human knowledge and the incredible density achieved with storing digital information in DNA. This work with Arch continues to push the boundaries of what's possible in increasingly exciting ways and remarkable directions."

"With DNA, Nature really nailed information storage at the molecular scale," said Luis Ceze, Professor of Computer Science and Engineering at the University of Washington. "Our goal at MISL is to explore how to build revolutionary systems around it. Memories in DNA gives everyone an opportunity to participate, and a way to preserve cherished memories. And now beyond planet Earth! We are honored to be part of this incredible project."

For more information about this project, the Lunar Library, or other efforts to preserve human knowledge and uncover new, secure frontiers for data storage, visit www.archmission.org.

About Arch Mission:

The Arch Mission Foundation designs, builds, delivers and maintains curated long-term archives that are housed in specially designed devices called Arch Libraries™ (pronounced "Arks"). Arch Libraries are being developed with a variety of form factors to survive for long durations in space, as well as on the surfaces of planets, moons and asteroids. The Arch Mission Foundation was co-founded in 2015 by Nova Spivack and Nick Slavov.

The Arch Libraries are already the longest-lasting records of human civilization ever created, and possibly that ever will be created. They may last billions of years longer than the Pyramids. They may even last longer than our planet. In a million years the Arch Libraries may be the only remaining trace of our species and our civilization.

In 2015, Nova Spivack and Nick Slavov co-founded the Arch Mission Foundation, and in 2016 the Arch Mission Foundation was formally incorporated. That year they were joined by Michael Paul and Matthew Hoelt, and in 2017 and 2018 the organization began to grow and attract a growing community of leading minds, and dozens of partner organizations.

For more information visit: www.archmission.org

Contacts

Media Contact | Angela Bitting
T 825-202-6211 | E media@twistbioscience.com