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Historic Bethlehem Museums & Sites Partners with Lehigh University Seismology Class

BETHLEHEM, PA November 2021 – Historic Bethlehem Museums & Sites (HBMS) has partnered with Lehigh University’s Dr. Mariah Hoskins, adjunct professor and postdoctoral researcher in the Earth and Environmental Sciences Department, to use Ground Penetrating Radar (GPR) to explore the Colonial Industrial Quarter. HBMS contacted Lehigh University’s Seismology class to help discover remains of the old tawry, oil mill, and butchery in the Colonial Industrial Quarter, along the Monocacy Creek. Relative locations of the torn down buildings are known due to exceptional record keeping. The purpose of uncovering the foundations of these long-gone buildings is to further understand and educate the public on the life of the 18th Century Moravians.

The Colonial Industrial Quarter can be considered America’s earliest industrial park with 35 crafts, trades and industries operating there in 1747. Today, this area is part of Historic Moravian Bethlehem National Historic Landmark District. Unfortunately, by the 1950s, this area became home to a junk yard and over the years through the restoration and preservation efforts HBMS has been transformed to an important place to share the stories of early industry in Bethlehem and one of the most photographed locations in the Lehigh Valley.

Dr. Hoskins and eight of her students from the Seismology: The Earth and the Environment class took to a cordoned off area inside the Colonial Industrial Quarter to use a GPR device to get a look at what is beneath the surface. The course is described as “An examination of how earthquakes and active source seismology are used to understand the Earth beneath our feet.” The class did an analysis of the area between the gravel path south of the springhouse that goes to the second floor of the waterworks and the large tree just north of the Waterworks.

Dr. Hoskins explains, “The Ground Penetrating Radar (GPR) survey we will complete in the Colonial Industrial Quarter is similar to a CAT scan of the ground. Through GPR, we can, without disturbing the ground at all, find evidence of the walls of buildings and other disturbances beneath the ground and map their locations.”

By pulsating electromagnetic waves into the ground, a high-resolution image of the subsurface was made and analyzed. In a client report written by the seismology students summarizing the findings of the survey, it was indicated that the GPR image was able to capture differences in subsurface materials based on their differing electromagnetic properties.

From analyzing the different reflections of the electromagnetic waves, the exact location of the tawry foundation was found. The tawry was one of the key industries in 1700s Bethlehem because it supplied the soft leather for various purposes such as book bindings, gloves, pocketbooks, and knee breeches for the community.
The Lehigh survey located one of the foundation walls for the 1768 structure. The entire foundation was not discovered during the survey. The report indicated more time and data collection is necessary in order to locate the other walls of the foundation. This is good news, because now there is a solid starting point to locate where this building once stood.

Dr. Mariah Hoskins received a BS in Geology at Brigham Young University in 2016, and went directly to Lehigh University, where she earned a PhD in seismology, focusing on the north Ecuador subduction zone and major earthquakes there. She completed her PhD last year, and began postdoctoral research at Lehigh, continuing research in seismology and mentoring graduate students. This semester, she gets to pass on her enthusiasm for seismology to undergraduate students by teaching the Seismology: Earth and the Environment class at Lehigh. Passionate about teaching and science communication, Hoskins also enjoys writing for Temblor Earthquake News. She hopes to inspire others with curiosity and greater understanding of the earth and natural hazards.

Of the collaboration between Historic Bethlehem Museums & Sites and Lehigh University, Dr. Hoskins notes, “It is a great opportunity for us to work with Historic Bethlehem. The collaboration is a chance for the students to put what they are learning in the classroom into practice and, even better, to contribute to their community. Education is good, but its true power comes when students can turn to benefit themselves and those around them with the knowledge they have gained. The collaboration with Historic Bethlehem provides one of those crucial bridges between the classroom and application that contributes to society.”

*Historic Bethlehem Museums & Sites is a not-for-profit institution that brings to life three centuries of American history. Historic Bethlehem tells the story of a small town of great influence, home to some of our nation’s early settlers, to the first pumped municipal water system in the American colonies, and to one of the world’s greatest industrial companies. Historic Bethlehem is located in eastern Pennsylvania, only an hour’s drive north from Philadelphia and 2 hours west of New York City. Historic Bethlehem is an Affiliate of the Smithsonian Institution and part of a National Historic Landmark District - a designated site on the US World Heritage Tentative List. HBMS is proud to be a part of the effort to bring World Heritage Site status to Historic Moravian Bethlehem. We are pleased to share that as of Spring 2021, HBMS will be working in tandem with international Moravian Sites – Herrnhut, Germany and Gracehill, Northern Ireland, UK to prepare a joint serial nomination to the World Heritage List – a first for the United States.*

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