

AVISTA Kalamazoo Sessions 2019

New Approaches to Old Problems: Using Modern Technology to Investigate Medieval Material Culture

Organizer and President: Vibeke Olson (University of North Carolina–Wilmington)

“From the Square to the Scanner: Revisiting the Geometries of Reims and Metz Cathedrals Using LiDAR,” Rebecca Smith (Wake Technical Community College) and Robert Bork (University of Iowa)

Modern technologies such as LiDAR scanning and CAD modeling can be used fruitfully in conjunction with each other to address some of the oldest and most fundamental questions in the study of medieval architecture, including: How was this building designed? What was the history of its construction? And, how does its design relate to that of similar buildings? More specifically, LiDAR permits the precise recording of 3D information about a building’s shape, while CAD makes it possible to develop hypothetical models of the structure’s geometry, which can then be rigorously tested against the LiDAR data. This comparison process can yield valuable new perspectives both on the originally intended geometries, and on the ways that they could be modified on the worksite, often to compensate for errors introduced in the course of the construction process.

We have recently been able to explore the potential of these linked investigative methods by applying them to the cathedrals of Reims and Metz, two of the largest and most impressive northern European Gothic churches. Focusing initially on Reims, and using only a fairly small laser scanner, we came to two important preliminary conclusions: First, that the cathedral’s overall plan and elevation are more unified than previously supposed; and second, that the implementation of this overall plan was compromised both by a series of rotations and misalignments in the choir, and by a pronounced bend in the nave. These findings already began to provide valuable clues about the sequence of the cathedral’s construction, confirming the idea that the building process of the chevet worked from the outside inwards, and raising that possibility that placement of the west façade was being established already well before the completion of the nave.

To test these hypotheses more rigorously, and to place the evolution of the Reims design more fully into context, we returned to France this summer to scan the cathedral more comprehensively, using a more advanced LiDAR scanner that we also used to survey the closely related cathedral of Metz. This survey campaign has allowed us to develop complete and highly detailed 3D models of both buildings, which we are making accessible to the scholarly community and to the wider world through on-line publication of the associated point clouds, which can be manipulated through freely available open-source software. This survey has also allowed us to extend our CAD-based testing of geometrical hypotheses about both cathedrals, demonstrating that the builders of Metz drew on the legacy of Reims not only in formal terms, but in geometrical terms as well.

“3-D Modeling and GIS Mapping of the Towers and Bell Towers of Medieval Rome,” Nicola Camerlenghi (Dartmouth College)

Perhaps the greatest challenge to studying Rome during the Middle Ages (roughly between 400 and 1400) is the absence of a holistic, spatiotemporal understanding of the city’s medieval urban fabric. To address this challenge, “Mapping Medieval Rome” proposes to assemble evidence of extant and lost structures upon a historically and topographically accurate GIS. This collaborative project builds upon the robust

cartographic digital platform devised by an interdisciplinary team of art historians, architects, computer programmers and designers centered at the University of Oregon, Stanford University and Dartmouth College.

The case study to be presented demonstrates how the process of digitally reconstructing, accurately plotting and analyzing models of Rome's myriad towers and bell towers can provide a groundbreaking and sophisticated technological approach to the subject. The three-dimensional, GIS-generated map permits us to reconsider why towers and bell towers were built in the first place and to examine newer question about their visual and acoustic qualities that have remained outside the realm of art history. Furthermore, by placing the towers onto a three-dimensional terrain map—which will eventually include streets and other features—we can quantify how these structures served to control territory and adjacent resources. For example, we can even model where missiles shot from slits in the towers might have landed during an attack. Such questions would hardly arise were they not prompted by the three-dimensional model itself; nor could they be answered by studying conventional evidence like plans, sections, or maps.

“To Divide the Light from Darkness: Architecture and Liturgy in the Churches of Norse Greenland,” Jess A. McCullough (College of St. Scholastica)

Buildings that Aren't Churches: The Wider Field of Medieval Architecture

Organizer and Presider: Maile Hutterer (University of Oregon)

“The Grand Master's Palace in Marienburg: New Research on the Most Modern Palace of the Late Middle Ages,” Christofer Herrmann, Technische Univ. Berlin

“Biographies of Buildings: Unexpected Stories from Earlier Medieval Manors,” Katherine Weikert, Univ. of Winchester

“History in Stone: Visual Biography and Mythmaking in Ávila's Medieval Walls,” Hannah Maryan Thomson, Univ. of California–Los Angeles

Medieval Ales Revisited: The Continuing Debate about Hops and Gruit

Organizer: Stephen Law (Medieval Brewer's Guild/AVISTA)

Presider: George Brooks (Valencia College)

“Medieval Gruit Ales Revisited: New Theories about Old Beverages,” Susan Verberg (Independent Scholar)

“Microbial Susceptibility of Hopped and Non-Hopped Ales,” Mary Elizabeth Sullivan (University of Central Arkansas) and Ben Rowley (University of Central Arkansas)

“Hildegard's Cerevisarius: Replicating the Ales of Eibingen Abbey,” Stephen C. Law (Medieval Brewer's Guild/AVISTA)

“The Gallic Origins and the Spread of Beer-Hopping,” Max Nelson (University of Windsor)

Archaeology and Experiment: Moving beyond the Artifacts

Organizer and President: Neil Peterson (EXARC)

“Working with Craftsmen: The ‘It Depends’ Dilemma,” Christina Petty (University of Manchester)

“Experiencing Viking Age Spinning Technologies,” V. M. Roberts (York University)

“Modeling of the Thermodynamic Properties of Interior Processes within a Barrel Smelter Using Measurements of Exterior Temperature Gradients,” Robert Gissing (Conestoga College)

“The Making and Breaking of Moulds: An Experimental Approach to Non-Ferrous Metalworking in Sweden,” Rachel Cogswell (University College Dublin)