



Spring 2015 Undergraduate Research Award Bridging Science and Visual Arts

A Medieval 'First In Flight': Court Science in Early Islamic Spain

This award recognizes undergraduate student research that creatively bridges the sciences and visual arts (broadly understood to include art, architecture, archaeology, and material culture) to explore a medieval milestone in the history of human flight, which took place in ninth-century Cordoba, the capital of Islamic Spain. The experiment is credited to 'Abbas Ibn Firnas, a court scientific practitioner and a celebrated figure in the Islamic scientific revolution of the ninth century.

Proposals are sought for the main research components, listed below. Other projects that explore or contextualize 'Abbas Ibn Firnas' other activities as a medieval scientific practitioner are also welcome, especially those that propose digital humanities approaches to the topic and make use of resources in the UNC Research Hubs and Makerspaces. The award is intended to cover or defray costs related to student research, which should be completed by the end of Spring semester, 2015.

Recipients will develop projects in consultation with Professors Glaire Anderson (Art History) and Jan Chambers (Dramatic Arts/ Playmakers Theater), whose research collaboration focuses on 'Abbas Ibn Firnas and the spaces and material culture of early Islamic court science.

Eligibility Currently-enrolled UNC-CH sophomores, juniors, and seniors are eligible to apply. First year students are not eligible for the reward but may explore these topics by enrolling in FYS Arth 089 (Islamic Art and Science) to be offered Spring 2015. Preference may be given to students whose project will fulfill one of the following:

- a spring course project requirement
- independent study leading to fulfillment of a degree requirement
- lay the groundwork for an independent project such as an Honors Thesis or project proposal for Summer Undergraduate Research Funding (SURF)

Students are encouraged to seek advice from the Office of Undergraduate Research Faculty Advisor in their academic unit in preparing their applications, particularly if their research requires specialized equipment. If selected, students are encouraged to present their research at the UNC Celebration of Undergraduate Research (CUR) on April 15th, 2015.

To apply send a one-page statement of interest/proposal, a budget (if applicable), and curriculum vitae to glaire@email.unc.edu by November 15, 2014.



Designing an Early Aviation Device

Participate in interdisciplinary research and design process, focusing on medieval materials, technologies, and textual and visual representations of flight and flying in the medieval Islamic lands. This research will inform the design(s) to be translate into 3D mockups.

Building/Engineering an Early Aviation Device

Creatively practice design and prototyping skills, reverse-engineering a device working from a medieval description of a successful flight (more accurately, a controlled glide) and materials similar to those that would have been used in the ninth century. The resulting model(s) will be tested in UNC wind tunnel. Student need not achieve a successful design, but rather explore why the problem is such a difficult one.

Wind Tunnel Analysis: Medieval Flight

Test and analyze model(s) of early aviation device in UNC wind tunnel, producing a computer model for 3D printing, and explanation of analysis for project website.

Mathematical Analysis: Medieval Flight

What would physically be required to lift a person into the air, sustain a controlled glide, make a turn, and successfully land? Using data gathered from wind tunnel analysis, student will attempt to mathematically model the mechanics of early human winged flight. Ideal for those with interest and skills in engineering, scientific computing/ coding, and fluid dynamics.

Website: A Medieval ‘First in Flight’

Design and build a website showcasing collaborative research project on ‘Abbas Ibn Firnas’ experiment in human flight. Content might include:

- Historical background and context of the flight
- Mouse-over translation of medieval Arabic manuscript page describing flight
- Image gallery, designs for the flight device, and scale model(s) as constructed
- Potentially, results of other student research, such as maps, timelines, computational analyses, simulations, 3D models, lesson plans that use the ‘Abbas Ibn Firnas’ experiment as basis for teaching math, physics, and/or world history/social studies content (elementary or middle school curriculum)