



**HIDDEN  
NO MORE**

**Advisory Board  
Newsletter**

**May 2021**

# Hidden No More

## Introduction

### **Introduction**

Todd Boyette, PhD, Principal Investigator

Considering the continued limitations related to the COVID-19 pandemic, the Hidden No More project team believes this newsletter is the best way to keep you informed of all that is happening with the project. I plan to follow up with each of you in June for a more detailed conversation and we hope to schedule an in-person meeting within the next 12 months to review progress. In the meantime, please enjoy this newsletter.

You will find links to videos Jay and team have produced and virtual reality experiences they have developed so you can see them for yourself. You will read descriptions about the interactive exhibits Crystal, Amber, Lizz and team have developed, and you can view photos of visitors interacting with them as we begin testing them this month. You will see how we are modifying our approach to pilot testing these project components by taking the show on the road and working with students in Gates County, North Carolina as well as at our partner sites in Wilson, North Carolina and Minneapolis, Minnesota. You can also learn about our research plans and the innovative approaches Jill and Janice are taking to collect data on the efficacy of the exhibit components. And you will hear from Jeff, our external evaluator, about what he has observed as the project team navigates within a constantly changing environment dominated by the pandemic.

All of the lessons we learn during this time will inform the later phases of the project and ensure we have a compelling and effective exhibit series for the informal science education sector. Broad dissemination will begin next spring, with the revised Phase 1 exhibits rolling out to six teen science café sites across the country and one site at California State University, Fresno.

Although COVID-19 continues to drive most of our decisions, I am pleased to write that it has not negatively impacted the ultimate goal of highlighting science stories that exist in the shadows. If anything, the project team is even more committed than ever to the goals of Hidden No More.



**“The pandemic has shown us the true costs of science denialism and marginalization of people. Any project attempting to address these issues and illuminate the shadows is worth figuring out in spite of the challenges faced.”**

- Todd Boyette, PhD, Principal Investigator

# Hidden No More

## Phase 1 Exhibits

### **Phase 1 Exhibits - Light and Color**

For this phase, the team focused on exploring the connection between light and color and on illuminating the work of the two featured scientists, Kamal al-Din al-Farisi and Mercedes López-Morales.

The team designed and pilot tested the project components with middle school students in Gates County, NC. They then built the Phase 1 exhibit components for installation at the three research sites: Morehead Planetarium and Science Center (Chapel Hill, NC), Imagination Station Science & History Museum (Wilson, NC), and the Bell Museum of Natural History (Minneapolis, MN).



The exhibit components fall into four categories:

- Short animation and documentary Films
- Hands-on Activities
- Virtual Reality Experiences
- Photo Backdrops

### **Short Films**

#### **Kamāl al-Dīn al-Fārisī**

The animation focusing on al-Farisi's rainbow experiments has been shown to the Advisory Board previously.

Click on the image to view the film:



#### **Mercedes López-Morales**

With travel limited as a result of COVID-19, Morehead staff pivoted — developing the documentary film, which focuses on López-Morales, from existing footage.

Click on the image to view the film:



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## Phase 1 Exhibits

### ***Hands-on Activities***

The hands-on activities were designed (and almost entirely built) by a Morehead team with wide experience in the development and delivery of hands-on learning experiences for middle school students, the targeted age group. Four activities are part of the exhibit:



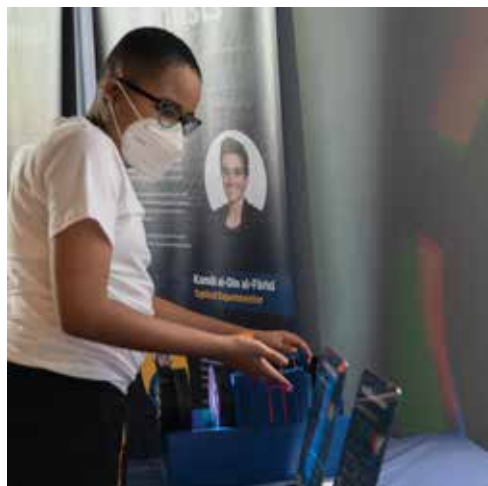
#### **Changing Color**

Visitors turn on lights of different colors (white, red, green, blue) to observe how objects of various colors appear to change color.



#### **Studying Spectra**

Visitors identify missing lines from the absorption line spectra of exoplanets to discover what each planet is made of and if it has molecules that can support life.



#### **Blending Beams**

Visitors use a light mixer to change the intensity of the primary colors of light (red, green, and blue) in order to make other colors, including white. (Vernier's Color Mixer Kit forms the basis of the hands-on apparatus at this station.)



#### **Filtering Color**

Visitors use filters to view nebulae and patterns, observing how various colors disappear or change depending on the filter applied.

# Hidden No More Phase 1 Exhibits

## Virtual Reality Experiences

As the first VR experience evolved, the team realized that organizing the experiences around scientists' workspaces would serve the project well. Each of the six experiences planned for the project will transport visitors to a workspace where they are invited to engage in their own discovery and research. In Phase 1, visitors work in a Persian observatory with a camera obscura, like the one where al-Farisi conducted his experiments. Visitors also go to a modern observatory where they get instructions from López-Morales, then conduct research in space.

Though VR invites imaginative exploration and aspects of game play, the developers focused on authenticity while developing the VR environments. Because one of the experiences is based on a Persian observatory that no longer exists, historical research was crucial. Content experts at the Oriental Institute of the University of Chicago reviewed source materials and provided advice. Meetings and correspondence with Mercedes López-Morales guided the content and script for the VR experience related to her work.



Click on the image to view the VR Gameplay:



## Photo Backdrops

The exhibit provides two backdrops for visitors' photographs. For this phase, the backdrops were created from artwork developed for the two VR experiences. Diffraction glasses are provided as a giveaway for visitors.



# Hidden No More

## Research & Evaluation

The research team is preparing to launch data collection with early adolescents as early as May, 2021, and continuing throughout the 2021 summer. Now that the Hidden No More exhibits are installed in the Morehead Planetarium and Science Center and Imagination Station and are open to visitors, we are working with these sites to identify events at which we can study teens as they engage with the exhibit.

We expect that our most comprehensive data collection will occur this summer, when we expect to work closely with partner sites to invite summer day campers to participate in the research study.

During this phase of the data collection, as they engage with the Hidden No More exhibit, participants will wear a “point of view” camera (e.g., a camera mounted in an eyeglasses frame) so that we can capture exactly what they view and for how long, as they proceed through the various exhibit components. Members of our research team will also interview participants about their experiences with the exhibit components and their perceptions about the science and scientists presented. Prior to and after engaging with the exhibit, participants will also complete surveys about their perceptions about science, scientists, and their own possible future as a scientist.



**“We’re excited for the insights we’ll gain into potential ways the exhibit contributes to teens’ science identity and learning, and to obtain their feedback about ways to strengthen aspects of the exhibits.”**

- Jill Hamm, PhD, Research Team Lead

### **Project Management Review**

Jeff Hayward, PhD, External Evaluator

This year has been another challenging one, with the pandemic keeping the team working remotely, and preventing easy contact with the intended audiences of middle school students. However, the team kept progressing on their various areas of responsibility and have coped well with the impact on their communications necessitated by these conditions.

One of the ways that I expected to assess and inform the team’s process was to track strategic decisions – where were the obstacles, how were they dealt with, what factors were facilitating or inhibiting the project’s overall goals? Mostly, the answer was the pandemic and its limiting impact on connecting with audiences to get early feedback. On the exhibit development front, it was impressive that Morehead staff proceeded to develop physical and VR exhibit components, activities and graphics with their best intuitions; internal feedback on those efforts was useful. On the evaluation front, Morehead staff were hampered by school closings and limitations on in-person interactions but created some clever opportunities to start testing exhibit activities with middle-schoolers. Formal evaluation of experiences – assessing learning objectives as well as exhibit component effectiveness – is set to begin with the rollout of installations at three sites beginning this month.

# Hidden No More

## Acknowledgements

**The following people have contributed to the project:**

### **Principal Investigators**

University of North Carolina at Chapel Hill

Dr. Todd Boyette, Lead PI

Dr. Janice Anderson

Dr. Jill Hamm

Dr. Crystal Harden

### **External Evaluator**

People, Places & Design Research

Dr. Jeff Hayward

### **Research Team**

UNC School of Education

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### **Exhibits Team**

Morehead Planetarium

& Science Center

Dr. Crystal Harden

Jay Heinz

Dr. Amber Vogel

Lizz Alfano

Ben Fox

Catherine Frazier

Glenda Hairston

Whit McMillan

Solomon Starling

Sarah Take

Josh Terrell

Kevin Young

Morehead staff brought prototypes of the hands-on activities to rural Gates County, North Carolina, in Fall 2020 so that middle school students in Morehead's Saunders Science Scholars Program could interact with them. These students' experiences with the prototype exhibit components guided further development of the activities.

Morehead staff engaged content experts Joshua Tulisiak and Tasha K Vorderstrasse at the Oriental Institute of the University of Chicago to review source materials and provide advice for the al-Farisi VR experience.

Morehead staff met and corresponded with Mercedes López-Morales, who guided the content and script for the VR experience related to her work.

Morehead is collaborating with Steve King, Ben Riley, and Daniel Sanchez of the Reese Innovation Lab, part of UNC-Chapel Hill's Hussman School of Journalism and Media, to develop the Hidden No More VR experiences.

Morehead engaged CHICLE Language Institute to translate exhibit text, including instructions for the hands-on activities, into Spanish.



**“I see a rainbow!”**

- excited Morehead Visitor,  
looking through diffraction lenses



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