**Interactive Cosmology Visualization Using the Hubble Ultra Deep Field Data in the Classroom**

Liam Nolan is an undergraduate student under the direction of Professor Windhorst in the School of Earth and Space Exploration at Arizona State University. He is conducting a research study to determine the effectiveness and best practices for use with a new teaching tool: Appreciating Hubble at Hyperspeed (AHaH), that we will use during a few AST 113 Labs in Fall 2020.

We are inviting your participation in this study, which will involve taking a short survey at the end of the AST 113 class to get your thoughts on the AHaH tool, which is available on <http://ahah.asu.edu/> and <http://windhorst113.asu.edu/>.

Your participation in this survey is entirely voluntary. If you choose not to participate or to withdraw from the survey at any time, there will be no penalty. Participating in the survey will not affect your AST 113 grade in any way. If you do participate, you have the right not to answer any question, and to stop participation at any time. You must be 18 or older to participate in the survey.

We believe that the use of this tool will greatly improve your experience in AST 113, and those of future students. By providing your feedback on the AHAH tool, you will help us make this tool more widely available to enhance the education of other students. There are no foreseeable risks or discomforts to your participation in the survey.

Your responses will be confidential, with your ASU email address collected for confirmation purposes, but deleted upon completion of the survey. Only Professor Windhorst and Mr. Liam Nolan will have access to the survey data. The results of this study may be used in reports, presentations, or publications but your name will not be used – results will only be used in aggregate form (i.e. “X percentage of the overall survey group gave Y response”).

If you have any questions concerning the research study, please contact the research team at: [ljnolan@asu.edu](mailto:ljnolan@asu.edu), or [Rogier.Windhorst@asu.edu](mailto:Rogier.Windhorst@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Thank you very much!

Rogier Windhorst and Liam Nolan