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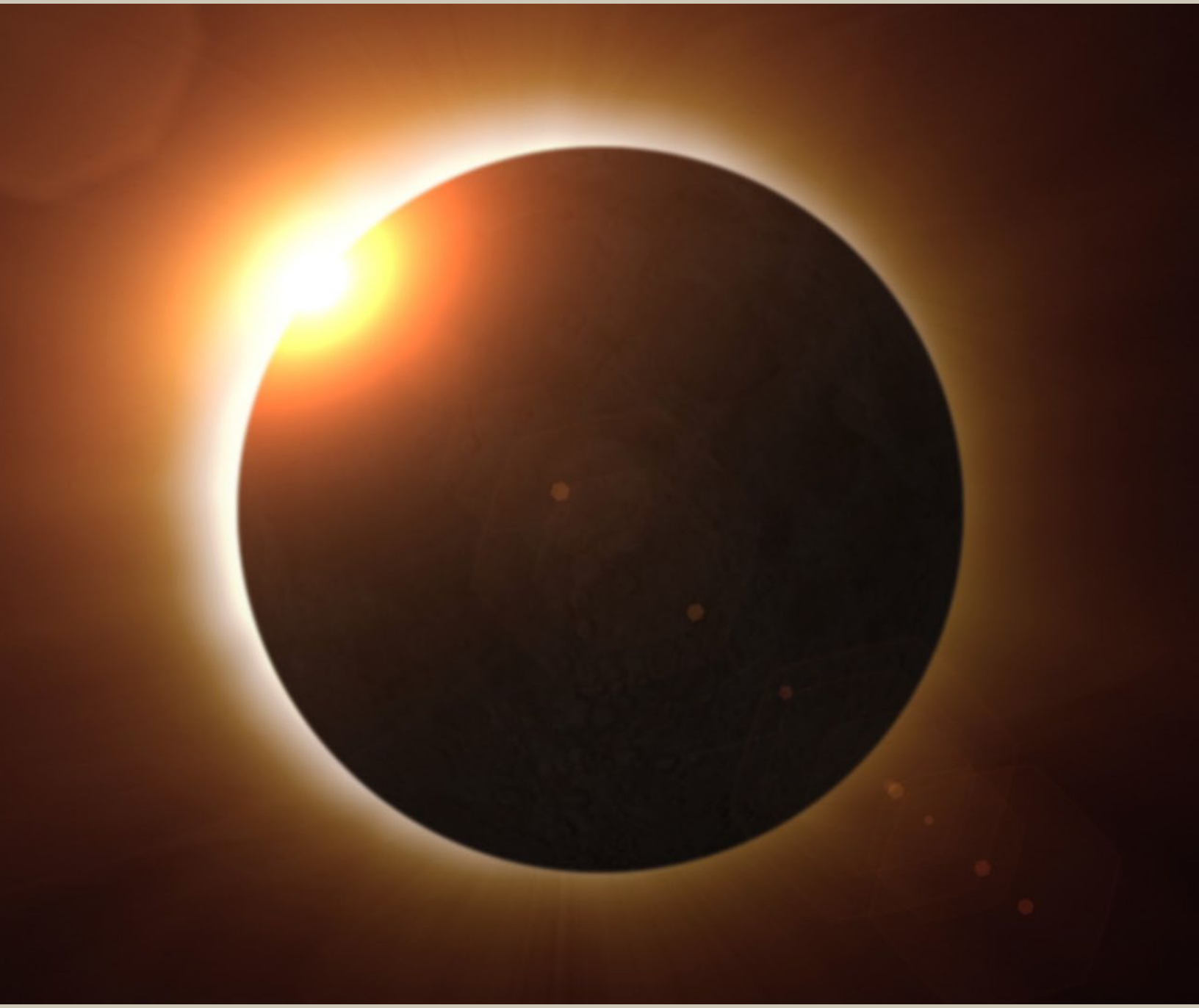
# ECLIPSE 2017 LIVESTREAM



## AN EVALUATION REPORT FOR NASA

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# Abstract

The Exploratorium hands-on science museum in San Francisco—with principal funding from NASA—produced a livestream of the Total Solar Eclipse 2017 from Madras, Oregon and Casper, Wyoming on August 21, 2017.

Successful dissemination of the livestream through many media channels and a mobile app provided high-quality coverage of the eclipse to an estimated 63 million people, NASA reported. Sixty major media providers, both online and conventional, widely rebroadcasted telescope feeds from the Exploratorium livestream.

Social media played an important role in promoting the eclipse and broadcasting the livestream to a wide audience. NASA reported 1.5 billion social media "eclipse posts" on the day of the eclipse. An estimated 182,000 people watched the stream on Facebook Live. Social media analytics reveal a robust conversation, positive sentiment, and active discussion of eclipse and STEM topics.

Edu, Inc., an external evaluation firm, conducted a study to help NASA understand the reach and impact of the Exploratorium's livestream and one-hour live programs in English and Spanish. The Exploratorium implemented all proposed activities as promised. Evaluation findings are positive.

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# Summary

With resounding success, the Exploratorium planned, promoted, and produced a onehour livestream, and two three-hour telescope only feeds of the complete eclipse event during the total solar eclipse in the United States on August 21, 2017, contributing to NASA Science Mission Directorate's (SMD) funding of public engagement in science.

From broadcast sites in Madras, Oregon and Casper, Wyoming, the Exploratorium provided one-hour live educational broadcasts in English and Spanish, as well as two live telescope feeds. Sonification—a live musical score based on data created by the sun's light as it was covered by the moon—was transmitted from the Exploratorium. The livestream was disseminated through NASA websites, NASA TV, the Exploratorium website, and apps for iOS and Android, reaching an estimated 120 million people. Over 60 major media providers rebroadcasted the livestream.

## EVALUATION DESIGN

The Exploratorium commissioned Edu, Inc., an external evaluation firm, to design a study to monitor project activities and gather data concerning the reach and impact of the livestream.

The mixed-method study combined descriptive statistics from Google Analytics and social media metrics with a user experience survey. Rich qualitative stories from interviews with users, expert reviewers, and Exploratorium staff provided further insights. Document review illustrated the use of the livestream in museums, libraries, and schools.

## EVALUATION QUESTIONS

Four questions offer a framework for the study.

1. How many unique users viewed the livestream by which media channels?
2. What is the sentiment and use of STEM terms in the eclipse conversation [1] on social media?
3. How and in what ways did the Exploratorium promote the eclipse livestream and programs?
4. What factors led to the successful planning, production, and distribution of the livestream?
5. What are the successes of and lessons learned from Spanish-language programming?

[1] STEM is an acronym for Science, Technology, Engineering, and Mathematics.

# Main Findings

## WHERE IS THE ADVANCED THINKING COMING FROM?

The Exploratorium clearly demonstrates advanced thinking and leadership in the area of producing, transmitting, and distributing a media-based informal science learning experience.

On August 21, 2017 the Exploratorium, a San Francisco based science museum, engaged the public in informal science learning via live streaming of the August 2017 solar eclipse that reached over 63 million people. On-demand videos on eclipse science topics—presented in English and Spanish—reached a total of 2.75 million people.

The key finding is that the livestream is the experience. Through the livestream and ondemand video, the Exploratorium delivered a museum experience to online, mobile, and social media users anywhere in the world. The outcome was promoting public engagement in science by going to people where they are, when they want – live or on demand.

In compiling this report, Edu finds five core observations to answer the evaluation questions.

First, the NASA-sponsored livestream had historic reach for both NASA and the Exploratorium. Over 63.3 million people viewed the Exploratorium's livestream, the Exploratorium website served 2.45 million views in August, and the Exploratorium's solar eclipse app served 591,000 sessions.

Second, social media played a catalytic role in engaging users in the eclipse. Analysis of 16.5 million tweets showed positive sentiment and heightened use of "STEM words" indicating active discussion of STEM topics on Twitter.

Third, the Exploratorium's strategic, professional promotion of the 2017 solar eclipse garnered significant national, San Francisco Bay Area, and online media coverage.

Fourth, the Exploratorium implemented successful programs. The Exploratorium again demonstrates the technical capacity to produce and distribute high-impact and innovative live STEM education programs and on-demand videos featuring eclipse content.

Fifth, the Exploratorium provided outreach to Latino and Spanish speaking audiences. The project produced the first NASA-sponsored one-hour live eclipse programming in Spanish. Exploratorium leadership provided resources for a professional Spanish-language production team on par with the English-language production team.