

# Communications and Public Outreach Science, Technology, Engineering and Mathematics (STEM) Engagement

## NASA Science, Technology, Engineering and Mathematics (STEM) Engagement

NASA is committed to engaging students nationwide to join us on our journey of exploration and discovery. The NASA STEM Engagement Enterprise continued to make valuable contributions to our nation's STEM ecosystem by creating mission-driven opportunities for students to contribute to NASA's work, helping to build a vibrant and diverse next-generation STEM workforce, and leveraging unique opportunities toward enhancing STEM literacy. Over the years, students have worked beside NASA engineers, scientists and technologists; participated in experiential learning opportunities; engaged in exhibits and activities in museums and out-of-school programs; and benefited from NASA investments in faculty, teachers and institutions nationwide.

NASA STEM engagement activities and opportunities is compelling: internships and fellowships, research and development opportunities, challenges and competitions, pre-college and college STEM learning experiences, educator and faculty support, and institutional investments. In FY2019, NASA's congressionally appropriated \$110 million STEM Engagement Program executed a robust and diverse set of projects and activities for the benefit of students at the K-12, undergraduate and graduate levels. These activities ranged from direct student awards for NASA internships and fellowships; student challenges, competitions and other learning activities; faculty and teacher opportunities and resources; awards to educational institutions for research and development; and awards to informal educational institutions to create and deploy student learning opportunities.

[https://www.nasa.gov/stem-ed-resources/NASA\\_STEM\\_Engagement\\_Highlights\\_2019.html](https://www.nasa.gov/stem-ed-resources/NASA_STEM_Engagement_Highlights_2019.html)

<https://www.nasa.gov/press-release/nasa-national-science-foundation-announce-support-for-white-house-stem-engagement-plan>

## MMS Data for Public Outreach STEM Engagement 2016 to March 2020

Since 2015, the MMS Outreach team has participated in approximately 500 STEM conferences, public outreach events and programs, professional development trainings and meetings. We believe we have directly exposed more than 120,000 people to the MMS mission and NASA space science education. We are extremely proud to be able to promote the unique MMS spacecraft, its discoveries and hands-on activities directly related to the science, engineering and technology of the mission. Our audiences have included the general public, formal and informal educators and very specific youth and adult groups.

The data below is a reflection of STEM conferences, STEM professional development trainings, STEM meetings and assemblies, Public Outreach events and expos, and NASA Headquarters and Center presented programs, engagements and launches (across the ten Centers).			
Fiscal Year	Number of Events Attended, Supported and/or Appeared via online webinars	Estimated Actual and Direct Participants	Number of NEW Partnerships and/or Collaborations Established
FY '20: October 2019 - Current Date 2020	66	11,885	5
FY '19: October 2018 - September 2019	109	39,250	6
FY '18: October 2017 - September 2018	117	45,500	8
FY '17: October 2016 - September 2017	88	24,000	4
This data was collected by Leslie Garrison during her tenure as MMS Outreach Coordinator.			
Previous data reported by Troy Cline for FY '15 and FY '16.			
Data derived from official event registration, materials and resources distributions and formal surveys/evaluations.			

## Connecting with NASA Space Science Education Consortium and Outside Collaborators

The NASA Space Science Education Consortium (NSSEC) capitalizes on NASA's rich history of sharing research and technology through compelling and innovative education projects. The NSSEC (formerly the Heliophysics Education Consortium (HEC)) continues the Science Mission Directorate's (SMD) work at the forefront of NASA's educational endeavors by linking exciting science and missions directly to the American public. The NSSEC has an extensive, engaged, and committed set of partnerships that bring unique, world class resources to SMD and communicate our messages to targeted populations. The NSSEC provides collaborative partnerships within SMD and with external organizations including: technology companies (Google), professional societies (e.g., International Society for Technology in Education [ISTE], American Association of Physics Teachers [AAPT]), community groups (e.g., Astronomical League [AL]), universities (e.g., University of North Texas [UNT]), school systems (through the NASA Office of Education), informal education venues (e.g., Museum of Science Fiction [MoSF], Maryland Science Center [MSC]), and minority serving institutions (e.g., Indigenous Education Institute and the University of Alaska / Fairbanks), as well as other NASA directorates and government agencies.

See our list of partners and collaborators here <https://science.nasa.gov/learners/science-activation-teams>

See MMS Senior Outreach Coordinator, Leslie Garrison in a 2017 Eclipse video from the San Francisco Exploratorium. <https://www.webbyawards.com/winners/2018/film-video/general/events-live-streams/total-solar-eclipse-2017-live-coverage-of-the-eclipse/>

## STEAM Innovation Lab at Goddard Space Flight Center

NASA's STEAM (Science, Technology, Engineering, Arts and Mathematics) Innovation Lab is a think tank with an emphasis on space science content applications. It brings together NASA scientists, engineers and educators to explore and develop new ideas related to infusion of educational technology into STEM activities, programs and approaches. Inside the lab are ten interchangeable STEM exploration stations fitted with technologies typically found in many of today's 21st century educational environments. By placing these stations in close proximity to each other, we encourage users to investigate how the technologies can be effectively blended together for greater impact and integration into NASA education programs and products. The MMS mission's data is used throughout the lab in the Virtual Reality (VR) station, the 2D Paper Cutting station and the Robotics station.

See our MMS work in the STEAM Innovation Lab

<http://www.steminnovationlab.org/stations/virtual-reality>

[https://www.google.com/searchq=NSSEC+NASA&tbm=isch&hl=en&chips=q:stem+innovation+lab+nssec+nasa,online\\_chips:stem+innovation+lab,online\\_chips:virtual+reality&rlz=1C5CHFA\\_enUS887US887&hl=en&ved=2ahUKEwjv9WS7szoAhUNVt8KHWNBDvMQ4YoAnoECAEQGg&biw=1400&bih=745](https://www.google.com/searchq=NSSEC+NASA&tbm=isch&hl=en&chips=q:stem+innovation+lab+nssec+nasa,online_chips:stem+innovation+lab,online_chips:virtual+reality&rlz=1C5CHFA_enUS887US887&hl=en&ved=2ahUKEwjv9WS7szoAhUNVt8KHWNBDvMQ4YoAnoECAEQGg&biw=1400&bih=745)

<https://www.kennedyspacecenter.com/blog/how-on-earth-are-nasa-science-and-art-related>

## MMS and NASA Edge

NASA EDGE is a public outreach vodcast sponsored by NASA's Exploration Systems Mission Directorate and based out of the Exploration and Space Operations Directorate at Langley Research Center in Hampton, Virginia. NASA EDGE takes an insiders look at current projects and technologies from NASA facilities around the United States, and is depicted through personal interviews, on-scene broadcasts, computer animations, and personal interviews with top scientists and engineers at NASA. The show explores the contributions NASA has made to society as well as the progress of current projects in materials and space exploration. NASA EDGE vodcasts can be downloaded from the NASA website and from iTunes. The MMS mission vodcasts have been downloaded more than 200,000 times.

April 2019 MMS in Mixed Reality <https://www.nasa.gov/nasa-edge/ne1302-mmsmixedreality>

November 2017 MMS with AP Physics Students <https://www.nasa.gov/nasa-edge/1114-apphysicsstudents>

September 2016 MMS Updates <https://www.nasa.gov/nasa-edge/1006-mms-update-daniel-gershman>

***This page contains MMS Education Public Outreach (EPO) highlights, updates and links to EPO materials, resources, presentations, plans and schedules. To add ideas, links and/or resources to this page, contact Leslie L. Garrison (Leslie.garrison@nasa.gov)***

## Upcoming Events:

- NSTA National Conference, Boston, MA, April 1-4, 2020
- Science Working Team / Group Meeting, NASA GSFC Virtual Meeting, April 15-17, 2020
- ISTE Conference, Anaheim, CA, November 28-December 1, 2020
- AGU National Conference, San Francisco, CA, December 7-11, 2020

## Links to MMS Education and Public Outreach (EPO) Resources:

MMS EPO Websites:

- [MMS Public Outreach STEM Website](#)
- [MMS at RICE](#)

### **Multimedia Resources:**

- [NASA.GOV MMS Videos](#)
- [MMS Media Resources](#)
- [YouTube Video Collection](#)
- [NASA EDGE](#)
  
- [The Faces of MMS Career Interviews](#)
- [Spacecraft Images and Multimedia](#)
- [MMS Educational Videos \(Rice\)](#)
- [MMS Engineering Challenge Video](#)

### **MMS Social Media Accounts:**

- [Facebook](#)
- [Twitter](#)
- [YouTube](#)
- [Pinterest](#)

### **Spacecraft Models:**

- [MMS LEGO Model](#)
- [MMS Paper Model and Bookmark Activity](#)
- [MMS Card Models](#)
- (In Development) [MMS Virtual Reality \(Oculus Rift\) Experience](#)

### **Lesson Plans, Activities and Programs:**

- [Lesson Plans/Guides \(MMS Website\)](#)
- [Space Weather Activity Guides \(Rice\)](#)
- [MMS Launch Party Kit](#)
- [The MMS Big Data Book \(DRAFT\)](#)