

Importance of Art to Reach & Inspire

Art and music can be a powerful tool and gateway to inspiration and motivation to learn more about Earth Science. Art provides the science with an emotional and intuitive connection. Combining art and science may be a powerful combination to inspire and engage students and the public through its unique 'whole-brain' approach appealing to emotional, creative and aesthetic sensibilities as a way to interest the audience in the material and facilitate engagement initiation. The creative-brain material grabs the attention of audience members, which then allows them to be more cognitively present to the analytic-brain oriented science content that is also communicated.



ICESat-2 'Biomes' outreach poster created by Savannah College of Art and Design (SCAD) students.

In addition to the power of art to inspire, it is becoming widely recognized that integrating the arts into science and STEAM approaches are a powerful way to increase participation in STEM, and improve attainment of STEM-related skills. In addition, it has the power to attract and inspire diverse audiences by first connecting with their own interests, which in many cases may not be science or math.

ICESat-2 Mission

The Ice, Cloud, and Land Elevation Satellite-2, or ICESat-2, launching in 2018, will measure the height of Earth from space using green lasers, collecting precise measurements of the elevation of ice sheets, glaciers and sea ice. Elevation changes will be monitored as small as 4 millimeters a year. In addition, height measurements of vegetation and forests will be taken for carbon inventory.

It is key to communicate why we are measuring these areas and their importance to the global climate system. The mission has a robust education and outreach program to inspire students, and inform and engage the public about the cool research and engineering of the mission. A key element in communicating the mission is the arts.

Website & Acknowledgements

<https://icesat-2.gsfc.nasa.gov/>

Thanks to the ICESat-2 outreach and communications team for their support and creative energy: Brian Campbell, Ryan Fitzgibbons, Adriana Manrique, and Kate Ramsayer, including Dr. Tom Neumann, Deputy Project Scientist, and Dr. Thorsten Markus, Project Scientist, ICESat-2. Also, all program students and SCAD Professors Deborah Fowler and Clarke Stallworth, and BGSU Professors Kim Turner Young and Bonnie Mitchell.

Art Student Collaboration

In 2014, the ICESat-2 mission teamed up with students and faculty from the Savannah College of Art and Design (SCAD) and Bowling Green State University (BGSU) to develop and produce a series of outreach products for the mission. Students were offered a blank slate at the beginning of the

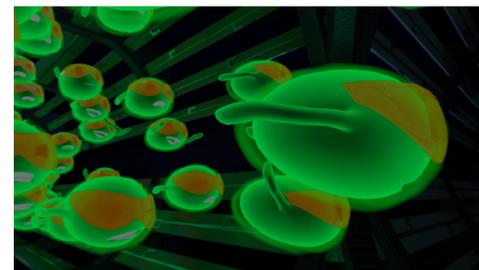
collaboration with the task to translate intricate and highly technical language into different outreach products to excite and educate the public – especially people who were not science aware - on how ICESat-2's data will impact and broaden the understanding of our planet's changing ice. Several concepts were produced out of the SCAD collaboration including a 2-minute animated short, character concepts, posters, website, and a lenticular bookmark.



'Pho' the Photon and 'Paige' the Penguin Mission Mascots and animated characters designed by SCAD art and design students.



Lenticular bookmarks designed by SCAD students



'Photon Jump' Animated short with sound (2 min, 17 sec)
<https://youtu.be/XMfewQHWXAO>



BGSU students with "Pop-up" Book

STEAM Programs

- **Bella Gaia (Beautiful Earth):** The mission is collaborating with Bella Gaia www.BellaGaia.com and Beautiful Earth program to bring the emotional connection to the polar regions, in an education program featuring a multi-media musical and visual live program, discussions with a NASA Earth Scientist, and hands-on experiments. The 4-year program was successfully run and uses art and music to make an emotional connection to our home planet mimicking the 'overview effect'* and provide a different mechanism to learning.



- **Augmented Reality experience with HoloGLOBE** – a platform created by Peter Dorofy of the Palmyra Cove Nature Park utilizing the Merge Cube to explore NASA and NOAA data visualizations and near real-time satellite data. Collaboration with Bella Gaia's composer and

director, Kenji Williams to incorporate music and art into the experience has also been initiated.

- **Art competitions**

- In 2018 an art competition will be implemented where participants will imagine/produce artwork, films, poetry, or music related to the ice, and the three-dimensional aspects of Earth.

- **Laser Photo competition:** Once ICESat-2 is launched and lasers are active, people may be able to see a flash of green light as the satellite passes directly over. Participants will take photos of the green light and share them with others around the world.

* The **overview effect** is a term coined by Frank White in 1987 and is a cognitive shift in awareness reported by some astronauts and cosmonauts while viewing the Earth from orbit or from the lunar surface.