



# SPACE MESSENGERS

**STEMarts** Activity Guide Introduction

# INTRODUCTION

We live in a time of extraordinary scientific and technological advancements that are expanding our understanding of the universe and our potential to create a future that is sustainable and equitable for all. And yet, as a civilization we face real threats of survival such as climate change, species extinction and pandemic diseases. Many warnings from climate change scientists say that it is already too late. Is this future possible? Plausible? Probable? Luckily there are people and organizations from all disciplines around the world that are coming together to imagine other possibilities, other futures. Futures thinking and foresight is a systematic process to anticipate and shape the future by imagining other possibilities, exploring what it might take to bring them about and creating plans to get there.

**“Futures literacy is the ability to anticipate and create invisible stuff – the future – through improvisation, experimentation, and invention” (Miller, 2018).**

In the Space Messengers workshop we will explore the universe through the diverse perspectives of experts in the field of science, art, philosophy, futures thinking and culture. Our hope is to expand our awareness, understanding and connection to the universe as planetary citizens. Through this creative process we will imagine alternative sustainable interplanetary futures.

The past decade has been called the Golden Age of Astronomy because incredible new instrumentation has shown us previously invisible realms in space. In this workshop we will learn from astrophysicist, **Dr. Nicole Lloyd-Ronning** that ripples in space-time from two black holes colliding can be felt here on earth revealing how interconnected we are to what is called ‘outer’ space. We will learn about multi-messenger particles which inspired the title of this project - Space Messengers - and how different particles from space send us messages that reveal different dimensions of our universe.

From CERN physicist **Dr. Steven Goldfarb** we will learn how scientists worked together to build a machine that would produce and visualize particles that existed only fleetingly at the birth of our universe. Their discoveries have revealed how elementary particles acquire their mass and continue to explore our most fundamental components, many of which originated in exploding stars. From this fundamental research in particle physics we also developed new technologies that change our future such as MRIs, PET scans, proton therapy and the World-wide Web.

Lakota artist and cultural specialist **Steve Tamayo** will take us on a journey back in time to explore where we come from through the lens of Lakota cosmology. We will learn how his people use observation and storytelling to study the stars, the weather patterns and their relationship to land and each other. In this way they developed a way to live in balance with the earth and all the species as an interdependent whole. How can this worldview be applied to imagine and create a peaceful and sustainable interplanetary future?

**Catarina Pombo Nabais**, Science-art curator and philosopher of science shares how philosophy, art and science are unique and different ways of understanding the world around us. In her video she shows how artists use their imagination to imagine new ways to see and understand the universe through physical creations and how their ideas often inspire or inform science, and vice versa.

**Frank Tavares**, Affiliated Researcher, Space Enabled Research Group at the MIT Media Lab, shares with us how space exploration today is accelerating and offering amazing possibilities for our future. Yet at the same time we are often repeating the ways of thinking from our past that created the environmental and social problems of the present. We will learn about bio-spills on Mars, satellite pollution and moon advertising and mining. He shows how using science fiction is a powerful tool to imagine alternative futures for space exploration that are more sustainable and equitable.

**Michelle Hanlon**, Co-Director, Center for Air and Space Law and founder of *In Moon Kind*, will take us through the evolution of the Outer Space Treaty of 1967 which was created to assure that space will be used for peaceful and humanitarian purposes. Where are we now and how can we assure that space will remain a common good for all.

Futures Thinking tells us that the future is not something that will happen to you tomorrow but is being created by everyone today. Future Thinking is a mindset and we are all *Future Imaginers!* (Riel Miller, 2003)