

Kira Rienecker
“Sunrise from Orbit”
The California Museum’s Dreamer’s Challenge Entry

Personal Statement:

My essay describes how my goal of becoming an astronaut will change the world’s approach to space exploration and the care of the Earth’s environment through my research in epigenetics and my role as a public figure. I have confidence in my ability to achieve my detailed but adaptable plan.

Sunrise from Orbit

When I listen to *Drops of Jupiter* by Train, I cannot help but imagine the view of sunrise from Earth’s orbit which astronauts on the space station are privileged to see every ninety minutes. The extraordinary beauty of this event enflames within me the passion behind my goal of becoming a mission specialist for the space program. I want to experience this sunrise for myself and forge ahead in the fields of microbiology and genetics, creating my own sunrises for science as I discover new technologies and ways of manipulating the epigenome, the expression of genes within the cell. I will explore the thousands of ways epigenetics and biotechnology can help us expand our space program and achieve amazing things on Earth and eventually on other planets. As an astronaut, I will draw the public’s attention and direct it towards science and the pressing needs of our environment. My dream will extend our ability to reach for the stars through new advances in our ability to manipulate the essential elements of life.

I have always loved science, but I became captivated by the field of genetics during my freshman year of high school. I am enthralled by our escalating ability to understand and manipulate it. The theories emerging around the world are startling. One of the most fascinating employs a virus to manipulate genes within a grown organism by infecting each cell in the body and inserting new genes into the organism’s original genome. This technique has the potential to solve numerous genetic problems including sickle cell anemia and surprisingly, aging. I am intensely interested in becoming involved in research related to this theory and in applying it to manipulate genomes for the purposes of my projects in space.

The most alluring way for me to satisfy my desire to study epigenetics is to pursue a career studying genetics in space and investigating the ways in which we may manipulate genes to further our ability to adapt to space and other harsh environments. I will help develop technology in the space program to manipulate genes within organisms that aid their adaptation to hostile conditions. This technology would also be crucial to our ability to adapt to a changing environment here on Earth. We cannot reverse the damage we have done to our planet, but we can continue to adapt as we always have. By modifying the genomes of various microorganisms to convert carbon dioxide and other greenhouse gasses into a less harmful form, we can lessen the damage. Epigenetic research in space will help preserve the life on our planet as we learn how to help organisms survive in similarly harsh environments.

As we explore other planets and search for other life in the universe, our knowledge of epigenetics and our capabilities in genetic manipulation will heavily influence what projects we undertake and our understanding of the new things we find. I am enticed by the possibility of modifying the genes of organisms such as bacteria and simple plants to thrive in environments previously hostile to life. Through this research, we will change the requirements for planets hospitable to life, vastly expanding the number of planets open to colonization by living organisms. Our entire world will change as we employ this new ability, and we will begin to consider possibilities previously confined to science fiction novels.

The summer after my freshman year I began volunteering as a Student Guide at the Monterey Bay Aquarium. As a volunteer, I frequently find myself completely inundated by excited children and explaining the importance of biodiversity and ecological preservation to both the children and their parents as their curiosity draws them in. My experience as a volunteer scuba diver, surveying the underwater kelp forest ecosystem with Reef Check, has helped me explain oceanic habitats and enrich the information I share with personal experiences. The delight that lights up the faces of visitors young and old as I describe what it looks and feels like to dive in a smack of jellies or at night through glowing bioluminescent dinoflagellates invigorates my own passion for learning and the environment. Every time I volunteer for the Monterey Bay Aquarium, my favorite part of the day is sharing my love of the ocean and concern for its preservation with the inquisitive crowd. I hope to perpetuate this delight and interest from the public throughout my career as an astronaut.

The interest the public has in astronauts will allow me to combine my desire to do research with my interest in promoting environmentalism. I am specifically interested in raising the public’s

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environmental awareness and in promoting policy that will improve our stewardship of Earth. As an astronaut, I will be a public figure and will be able to direct the public's attention and concern towards pressing environmental issues. This connection further cements my belief that my perfect career is that of a mission specialist in the space program. I will shift the world's focus towards the environmental movement and the issues it addresses to assist the preservation of our planet.

My dream will change the world because as I orbit the earth, reveling in the sunrise every ninety minutes, I will be surging ahead in new genetic research that will change the very nature of our exploration of space. New advances in genetic manipulation will not only bring about revolutionary changes in our ability to adapt to our planet's changing climate, but will enable us to make science fiction a reality as we expand life to other planets. As a public figure I will lead the world in environmentalism and the quest to preserve our planet. I dream that as an astronaut, a sailor of the stars, I will bring about a new sunrise for genetic research and space exploration, changing the way we think about and manipulate life.