Team Number: SPS128
School Name: Sandia Preparatory School
Area of Science: Astrophysics
Project Title: Likelihood of Planets of Specific Types

Our solar system is a prime example of a complex and life-bearing system, however, we do not know whether or not this sort of system is a commonality or a complete fluke. To decipher this puzzle we will write a program to simulate the development of a solar system to see which planet types will function and create stable orbits and what planet types will fly off into the dark reaches of space.

In this project we are attempting to produce a simulation that will form a pseudo-randomized solar system based on a set of parameters. This means that, not only can we create a visual diagram of solar system formation, but a reliable generator which can, over time, produce a likelihood of any specific system to form planets in the "Goldilocks" Zone and, when placed in conjunction with a universe colonization simulation will create a reasonable system for which we can better understand our universe and the likelihood of colonizable worlds.

In order to create this simulation in a computational way we will be using[1] the accepted formula to compute velocities, the uniform gravity of mass-having objects and the force enacted upon these objects by all other such objects. These will likely use attributes of turtles to find such values and enact them upon the turtle. The issue here is computing the angle at which we must move at and the vectors that must be created which, in turn, must be acted upon. Then we must carefully handle the use of particles and/or turtles which represent gases, as they may behave in odd ways as compared to solid particles. We will likely use some sort of turtle of other moveable object with a comparatively small size and/or given mass.

As of now, most of our group has had less than two years of experience with coding and we've been working on understanding the Python language since the beginning of the school year, as none of us have used the Python coding language in any capacity. We're currently able to write fairly complex code with turtles and game-like constructions using loops and lists. One of our group recently coded an AI for the game of Tic Tac Toe which, as of this writing, only one person has beat!

Because none of us are astrophysicists, we cannot draw our own conclusions about the possible results, however, using current reports that we have read, we can predict that a good number of these systems will be uninhabitable, due either to massive amounts of radiation and a multitude of large, close orbiting gaseous bodies.

Team Members: Cal Boye-Lynn, Noah Peterson, Parker Willis

Sponsoring Teacher: Neal Holtschulte

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[1]For reference, we will be using the Python programming language.