# Spatial Distribution of Known Exoplanets and Potentially Habitable Exoplanets within 100- Light Years from Earth

Mendez-Pons, Mirelys (School: Escuela Superior Josefa Velez Bauza)

This investigation had the goal of identifying clusters of exoplanets and potentially habitable exoplanets that are within a 100-light-year distance from Earth, to see if there is any relationship between them. The problem presented was: How can the spatial distribution represented in 2D Approach (R.A and Dec.) of all known exoplanets within a 100-light-year distance from planet Earth be related to the exoplanet's habitability? And the hypothesis presented was: If there is any cluster of all the known exoplanets within a 100-light-years distance from planet Earth that might have the possibility of being habitable then there will be a relationship between the exoplanet's distance and habitability. A free computer software that analyzes spatial data was used to analyze the spatial data of all exoplanets. After studying the spatial distribution of both exoplanets and potentially habitable exoplanets, it was found that the graphic of the 337 exoplanets contained 18 clusters and that the biggest one had 28 exoplanets. The second graphic of the 25 potentially habitable exoplanets contained 5 clusters and the biggest one had 8 exoplanets. With this knowledge in mind, it was determined that exoplanets were distributed randomly throughout the universe and that the distance of an exoplanet from Earth does not influence its possibility of being habitable. Therefore, the hypothesis of the investigation, was rejected because while it is true that there are potentially habitable exoplanets within 100 light years from Earth, an exoplanet being further out in the galaxy was not a determining factor for its habitability.

**Awards Won:**