

## Target 3: Saturn

I believe that Target 3: Saturn is the best target for the Cassini spacecraft. This is because we currently know very little about the rings that orbit Saturn and this picture could help us decipher more about these marvels of the universe and provide building blocks for future fly-bys based on information discovered from this photo.

The rings which orbit Saturn have puzzled scientists for years. The occultation of the star Spica by the rings will help us to understand more about the complexities of Saturn's rings. By measuring the light intensity through the rings, we will be able to understand a lot more about them such as the structure of the rings including their thickness, and also a lot about the particles which make up the rings. This will be extremely useful as it could provide new information which could lead to further discoveries about them.

By learning about the rings structure, including the shapes and sizes of the particles and how they interact with each other, we will be able to learn a lot about them. From some data which could be collected, we may be able to learn when they were formed, how they were formed, and more about the 'Shepard Moon's' role in the rings. At the moment, only theories exist about the formation and complexities of the rings, but this could become vital information which could help scientists to fully discover the secrets which are held inside the rings themselves.

Furthermore, some previous data collected by the Cassini space probe suggests that Saturn's rings may have their own atmosphere consisting of  $O_2$ ,  $H_2$ , and  $OH$ . By discovering more about this through the picture, we can learn more about the formation of the rings. If we know more about how the atmosphere was formed, we can also learn more about how the rings were formed as they were probably formed at the same time, through the same process. Scientists believe that the atmosphere is growing still through ultraviolet simulation, so could the rings also be growing as we speak? Scientists believe that Saturn's rings can't stay as they are and are constantly being reformed. The ring system is unstable and must be regenerated constantly, but we don't know how. From this picture, we might be able to see what causes the rings to stay as they are. This picture will allow us to delve deeper into this mystery.

I believe that the most scientifically valuable target is Saturn because of the information that we could collect about the rings that orbit the planet, which in turn could help us to understand more about what goes on there. We must seize this opportunity as there are many mysteries still unsolved surrounding Saturn and its rings and the photographic evidence we could collect would help us to comprehend more about Saturn. This is a hugely valuable opportunity which could provide enlightening information on Saturn and could fuel future missions focusing on subjects discovered from evidence in this photo.