Finding Hazardous Asteroids Using Infrared And Visible Wavelength Telescopes

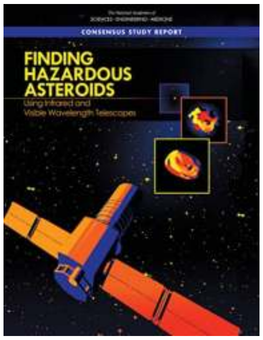
The Importance of Detecting Hazardous Asteroids

In recent years, the topic of hazardous asteroids has captured the attention of scientists, astronomers, and the general public alike. These giant space rocks have the potential to cause catastrophic damage if they were to collide with Earth. Therefore, it is crucial to develop effective methods for detecting and monitoring hazardous asteroids to ensure the safety of our planet. In this article, we will explore the use of infrared and visible wavelength telescopes in finding these potentially dangerous objects.

The Role of Infrared Telescopes

Infrared telescopes play a significant role in the search for hazardous asteroids. Unlike visible light, infrared light can penetrate the thick layers of dust and gas that often surround these celestial bodies. By observing asteroids in the infrared spectrum, scientists can gather valuable data about their size, composition, and other physical properties.

One of the most famous infrared telescopes used for asteroid detection is the NEOWISE spacecraft. It stands for Near-Earth Object Wide-field Infrared Survey Explorer and is a NASA mission specifically designed to find and characterize asteroids and comets that could potentially pose a threat to our planet. NEOWISE has already discovered thousands of asteroids, providing astronomers with invaluable information to assess their potential hazard.



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by H.A. Husny (Kindle Edition)

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The Power of Visible Wavelength Telescopes

While infrared telescopes are vital in detecting asteroids that are difficult to observe with the naked eye, visible wavelength telescopes also play a crucial role in the search for hazardous asteroids. These telescopes capture images and collect data in the visible spectrum, allowing astronomers to study the morphology and movement of asteroids.

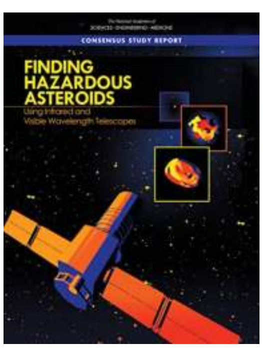
One of the most well-known telescopes used for asteroid observations is the Hubble Space Telescope. Although primarily designed for studying distant galaxies and nebulae, the Hubble can also provide detailed images and precise measurements of near-Earth asteroids. The visible wavelength data collected by the Hubble helps scientists track and monitor the potentially hazardous objects and refine their orbits.

Combining Infrared and Visible Wavelength Data

While both infrared and visible wavelength telescopes have their unique strengths, combining the data from these two types of observations can provide a more comprehensive understanding of hazardous asteroids. By using the information obtained from both types of telescopes, astronomers can obtain a more accurate assessment of an asteroid's size, composition, rotation, and orbit.

Furthermore, combining infrared and visible wavelength data allows scientists to identify any potential threats that might be lurking in interplanetary space. By cross-referencing the observations from different telescopes, researchers can identify asteroids that may have gone unnoticed in previous studies, enabling them to prioritize their monitoring efforts and potentially avert any future impact disasters.

The search for hazardous asteroids is a critical field of study that requires the use of advanced tools like infrared and visible wavelength telescopes. As technology advances, these telescopes play an increasingly important role in detecting and monitoring potentially dangerous asteroids. By combining their unique capabilities, scientists can gather detailed information about these celestial objects and take the necessary measures to protect our planet from potential impact disasters.



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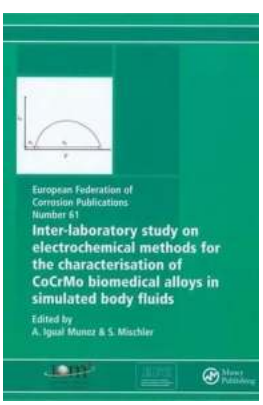
Near Earth objects (NEOs) have the potential to cause significant damage on Earth. In December 2018, an asteroid exploded in the upper atmosphere over the Bering Sea (western Pacific Ocean) with the explosive force of nearly 10 times that of the Hiroshima bomb. While the frequency of NEO impacts rises in inverse proportion to their sizes, it is still critical to monitor NEO activity in order to prepare defenses for these rare but dangerous threats. Currently, NASA funds a network of ground-based telescopes and a single, soon-to-expire space-based asset to detect and track large asteroids that could cause major damage if they struck Earth. This asset is crucial to NEO tracking as thermal-infrared detection and tracking of asteroids can only be accomplished on a space-based platform. Finding Hazardous Asteroids Using Infrared and Visible Wavelength Telescopes explores the advantages and disadvantages of infrared (IR) technology and visible wavelength observations of NEOs. This report reviews the techniques that could be used to obtain NEO sizes from an infrared spectrum and delineate the associated errors in determining the size. It also evaluates the strengths and weaknesses of these techniques and recommends the most valid techniques that give reproducible results with quantifiable errors.



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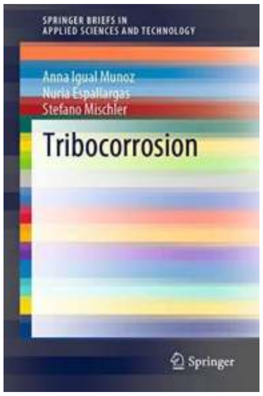

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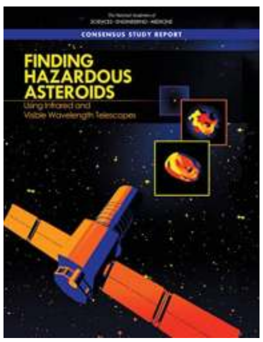

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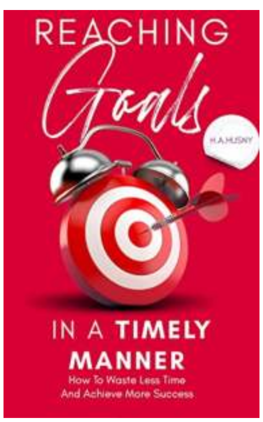

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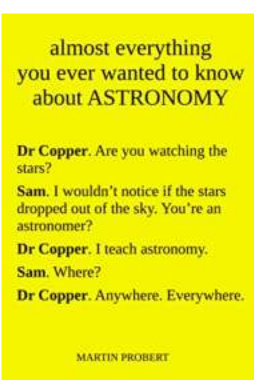

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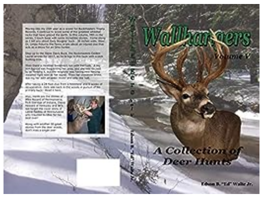

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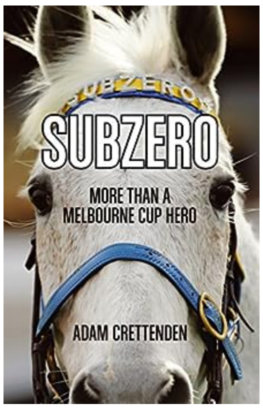

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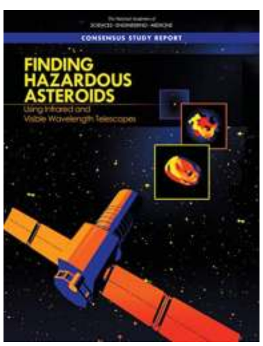

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