MATHEMATICAL FOUNDATIONS OF PROCESSING THE RESULTS OF ASTRONOMICAL SCIENTIFIC OBSERVATION

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ANNOTATION

These objects are very far away from Earth; moreover, they are the most interested and attractive objects for human beings. Human beings are continuously developing and installing the observational facilities (telescopes) for solving the mystery of the Universe. The various photometric bands/filters are associated with these telescopes, and each band show different effective wavelength to detect the information about the interior physical phenomenon. The detected information can be used to constrain the dynamism and evolution model of interested stellar objects. Heavier atoms of matter are to be made in the interior part of stars and prescribed matter to pervade into space through the "Supernova burst". Our earth is also made of such type materials.

Key words: constrain the dynamism and evolution, type materials, information

As a result, the iron in our blood, required oxygen of our breath, carbon, nitrogen, etc. of our tissues and calcium in our bones was formed through the fusion of smaller atoms at the center of a star. There are the several theories for explaining the formation of the planets, stars and other astronomical objects. These theories are guide to us for understanding the truth of formation of the Universe, but these are not truth itself. Consequently, these said theories are continuously revised and to keep leading us in the right direction. The astrophysics is a deeper understanding of the Universe and the information about the evolution of the Universe is continually increased through the analysis of new collected data. Moreover, this information is further leading the new concepts/models for describing the our present Universe and its future. Other words, the astrophysics are a scientific branch to understand the formation of planets, stars, pulsars, galaxies etc. and their associated physical phenomenon. The revolutionary changes has been occurring in the literature of astrophysical study due to the incorporation of new technology and algorithms. In the 19th and 20th centuries, the astronomical studies had been carried out through the photoelectric and photographic data. The astronomical data had been collected through the various ground based observatories and space missions.

Observational astronomy is a division of astronomy that is concerned with recording data about the observable universe, in contrast with theoretical astronomy, which is mainly concerned with calculating the measurable implications of physical models. It is the practice and study of observing celestial objects with the use of telescopes and other astronomical instruments. As a science, the study of astronomy is somewhat hindered in that direct experiments with the properties of the distant universe are not possible. However, this is partly compensated by the fact that astronomers have a vast number of visible examples of stellar phenomena that can be examined. This allows for observational data to be plotted on graphs, and general trends recorded. Nearby examples of specific phenomena, such as variable stars, can then be used to infer the behavior of more distant representatives. Those distant yardsticks can then be employed to measure other phenomena in that neighborhood, including the distance to a galaxy. Galileo Galilei turned a telescope to the heavens and recorded what he saw. Since that time, observational astronomy has made steady advances with each improvement in telescope technology. Subdivisions The Crab Nebula as seen in various wavelengths A traditional division of observational astronomy is based on the region of the electromagnetic spectrum observed: Radio astronomy detects radiation of millimetre to decametre wavelength. The receivers are similar to those used in radio broadcast transmission but much more sensitive. See also Radio telescopes. Infrared astronomy deals with the detection and analysis of infrared radiation (this typically refers to wavelengths longer than the detection limit of silicon solid-state detectors, about 1 μm wavelength). The most common tool is the reflecting telescope, but with a detector sensitive to infrared wavelengths. Space telescopes are used at certain wavelengths where the atmosphere is opaque, or to eliminate noise (thermal radiation from the atmosphere). Optical astronomy is the part of astronomy that uses optical instruments (mirrors, lenses, and solid-state detectors) to observe light from near-infrared to near-ultraviolet wavelengths. Visible-light astronomy, using wavelengths detectable with the human eyes (about 400–700 nm), falls in the middle of this spectrum. High-energy astronomy includes X-ray astronomy, gamma-ray astronomy, and extreme UV astronomy. Occultation astronomy is the observation of the instant one celestial object occults or eclipses another. Multi-chord asteroid occultation observations measure the profile of the asteroid to the kilometre level. Addition to using electromagnetic radiation, modern astrophysicists can also make observations using neutrinos, cosmic rays or gravitational waves. Observing a source using multiple methods is known as multi-messenger astronomy. Ultra HD photography taken at La Silla Observatory.

The atmosphere is opaque at the wavelengths used by X-ray astronomy, gamma-ray astronomy, UV astronomy and (except for a few wavelength "windows") far infrared astronomy, so observations must be carried out mostly from balloons or space observatories. Powerful gamma rays can, however be detected by the large air showers they produce, and the study of cosmic rays is a rapidly expanding branch of astronomy. Important factors For much of the history of observational astronomy, almost all observation was performed in the visual spectrum with optical telescopes. While the Earth's atmosphere is relatively transparent in this portion of the electromagnetic spectrum, most telescope work is still dependent on seeing conditions and air transparency, and is generally restricted to the night time. The seeing conditions depend on the turbulence and thermal variations in the air. Locations that are frequently cloudy or suffer from atmospheric turbulence limit the resolution of observations. Likewise the presence of the full Moon can brighten up the sky with scattered light, hindering observation of faint objects. For observation purposes, the optimal location for an optical telescope is undoubtedly in outer space. There the telescope can make observations without being affected by the atmosphere. However, at present it remains costly to lift telescopes into orbit. Thus the next best locations are certain mountain peaks that have a high number of cloudless days and generally possess good atmospheric conditions (with good seeing conditions). The peaks of the islands of Mauna Kea, Hawaii and La Palma possess these properties, as to a lesser extent do inland sites such as Llano de Chajnantor, Paranal, Cerro Tololo and La Silla in Chile. These observatory locations have attracted an assemblage of powerful telescopes, totalling many billion US dollars of investment. The darkness of the night sky is an important factor in optical astronomy. With the size of cities and human populated areas ever expanding, the amount of artificial light at night has also increased. These artificial lights produce a diffuse background illumination that makes observation of faint astronomical features very difficult without special filters. In a few locations such as the state of Arizona and in the United Kingdom, this has led to campaigns for the reduction of light pollution. The use of hoods around street lights not only improves the amount of light directed toward the ground, but also helps reduce the light directed toward the sky. Atmospheric effects (astronomical seeing) can severely hinder the resolution of a telescope. Without some means of correcting for the blurring effect of the shifting atmosphere, telescopes larger than about 15–20 cm in aperture can not achieve their theoretical resolution at visible wavelengths. As a result, the primary benefit of using very large telescopes has been the improved light-gathering capability, allowing very faint magnitudes to be observed. However the resolution handicap has begun to be overcome by adaptive optics, speckle imaging and interferometric imaging, as well as the use of space telescopes.

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