REVOLUTIONARIES OF THE SKY

Astrophysicists, astronomers, engineers... who changed our understanding of the Universe and gamma-ray astronomy!

Jocelyn Bell Burnell (1943-)

Northern Ireland astrophysicist who discovered the first radio pulsar in 1967. Pulsars, born from the death of massive stars, are extremely fast rotating and magnetized stars, whose light is emitted in beams. When those beams cross our line of sight, we can see them... like a cosmic lighthouse! Pulsars are extremely important sources in gamma-ray astronomy. In fact, one of the most famous sources in this energy band is actually the Crab pulsar.

Victor Hess (1883-1964)

In 1912, and through several balloon flights, this Austrian physicist discovered that there were extremely energetic charged particles from the Universe (like tiny balls that, individually, are invisible to the human eye but form all the matter we know) that constantly bombard the Earth's atmosphere: cosmic rays. This revolutionized the understanding of our Universe and initiated a new field of knowledge and investigations at the highest energies.

Vera Rubin (1928-2016)

This American astronomer provided us with the most robust evidence, so far, for one of the biggest mysteries in science: dark matter. Considering the mass we can see, the objects in a galaxy located closer to its center should orbit faster around the center than those situated in the outer parts, because of the attraction they feel. However, Rubin measured in different galaxies that the stars had all the same velocity, independently of their distance to the center. This implied that there was a mass there that we could not see and that affected the gravitational attraction of the objects... dark matter! Her findings were revolutionary and have kept scientists busy ever since to understand the nature of dark matter.

Pavel A. Cherenkov (1904-1990)

There is nothing that can move faster than light in a vacuum. However, in other mediums, like air or water, the light's velocity is slower, allowing the high-energy particles to move faster than light. In 1934, the Russian physicist Pavel Cherenkov discovered that when charged particles move faster than light in a medium, they emit a bluish light, which was named after him: Cherenkov light. When a gamma ray hits the Earth's atmosphere, it produces a cascade of high-energy particles that give rise to this phenomenon. The **Cherenkov Telescope Array (CTA)** will use its telescopes to capture the Cherenkov light that is produced in these particle cascades so that scientists can collect indirectly information about the gamma ray and its cosmic source.

Visit www.cta-observatory.org/outreach-education/CTA-for-educators

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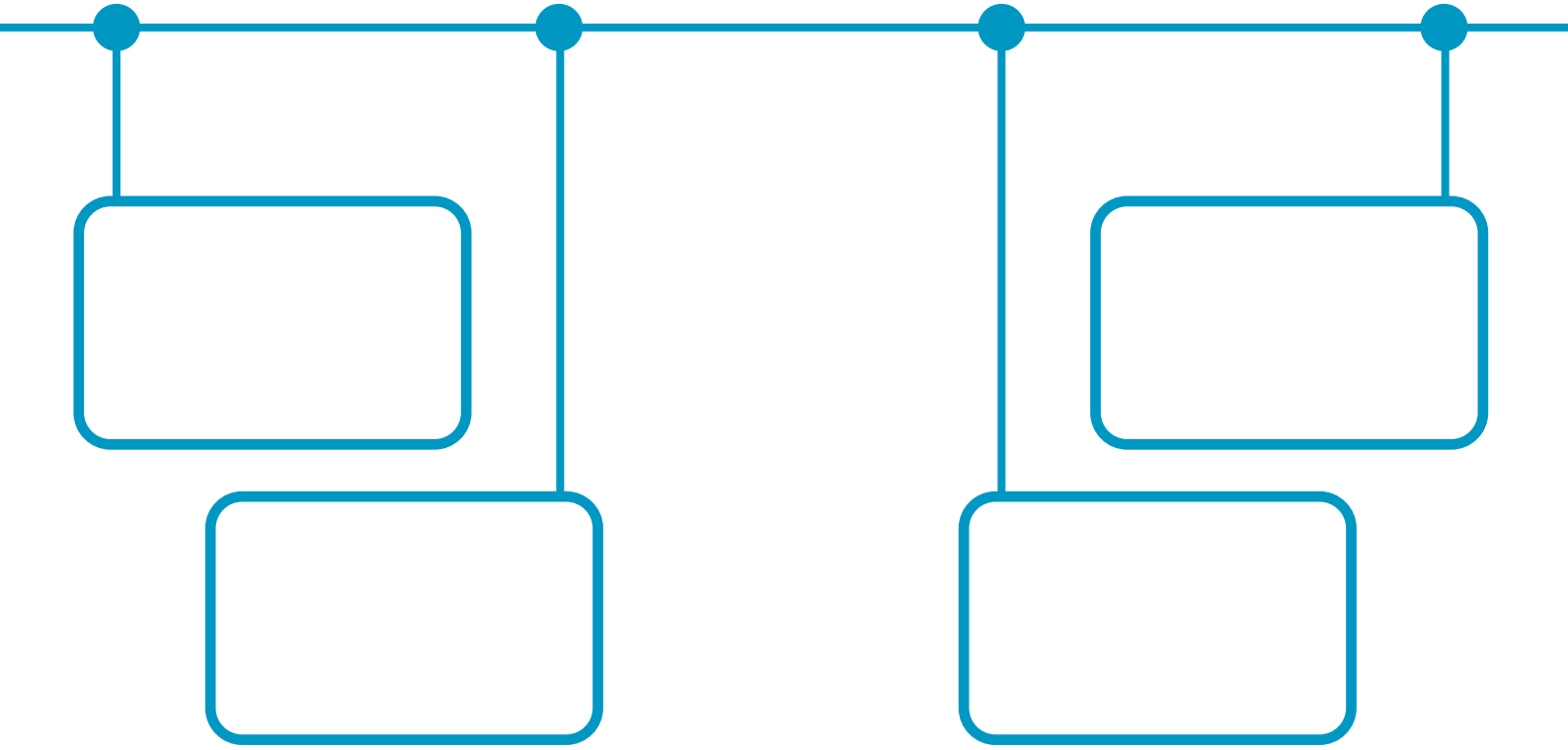
READING COMPREHENSION ACTIVITIES

1. Organize chronologically each famous physicist, specifying her/his name, date of birth and death (if any), nationality and major achievement.



2. In this activity you need to pull out all your researcher's skills! Investigate and create a list with four modern innovators (two women and two men) contributing to the field of science today and their biggest achievements. Not all of them have to be astrophysicists or astronomers, they could be engineers, technicians, science communicators or they could work in other fields, like particle physicists, laser physicists, mathematicians, programmers, etc. Once you have your list, imagine how their accomplishments may help the study of the Universe, gamma rays or the Cherenkov Telescope Array. Be creative! Many different fields can contribute to the success and growth of all sorts of disciplines. Diversity makes science stronger!