The secret skies of Kalahari

In northeastern Namibia, the Jul'hoansi hunter-gatherers have developed a unique astronomical knowledge, but their precious connection to the lunar cycle is threatened by light pollution.

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The Jul'hoansi people are a hunter-gatherer group residing primarily in northeastern Namibia and parts of Botswana and Angola. This ancient tribe is known for their trance dance, a spiritual practice that connects them to the spiritual powers of the stars for healing. As one elder explains it: "My father would dance the traditional dances at night – and if one was very ill and sleeping, he would dance until they woke up."

Considered to be the first inhabitants of southern Africa, the Jul'hoansi of Namibia lead a semi-traditional lifestyle as they navigate the old world and the new digital age. They still use the lunar cycle to develop complex hunting strategies to sustain their nomadic lifestyle. They see the night sky as a living entity that has guided them through many civilizations, providing them with precise knowledge for understanding time and the seasons in their pursuit of wild food and medicine.

> "The Jul'hoansi use the lunar cycle to develop complex hunting strategies"

Today they see their ancestors as the first astronomers who observed and theorized about the night sky, developing complex knowledge systems that helped them better understand the interconnectedness of life on Earth with the

cosmos. Their knowledge remains primarily oral and is transmitted through storytelling, myths, legends, dances and rituals.

The cosmic tale

The Jul'hoansi possess a cosmic narrative that explains the universe's creation. Central to the myth is the ostrich, a flying bird created by the God for Good and the God for Bad – who existed in isolation and balance before the universe was born. The bird flew around the unlit world, dropping a feather every day. According to the legend, the gods tied these feathers to a kite that showed if the bird was feeling hopeful or sad. Eventually, the ostrich dropped its last feather, which glowed so brightly that it transformed into the Moon and stars. That's how the sky was lit up and the ostrich became one of the many constellations in the Southern sky.

> "According to the Jul'hoansi, the celestial and terrestrial environments' well-being is paramount to human existence"

This cosmic narrative of a bird present at the birth of creation is echoed in several Indigenous cultures worldwide. The Jul'hoansi believe in the spiritual connection and interdependence of humans with both the celestial and terrestrial environments, asserting that the well-being of both is paramount to human existence and the health of the broader ecosystem. This traditional wisdom holds valuable potential to complement modern scientific methods in the areas of environmental adaptability and sustainability.

Artificial lighting

Yet, indigenous knowledge of astronomy is disappearing at a rapid rate, especially in Africa. Little remains of the storytelling around the fire once so commonplace in many African cultures, when Indigenous knowledge of astronomy was transmitted verbally. In parallel, night skies are disappearing just as quickly, as even rural areas are increasingly polluted with artificial lighting.

Global initiatives, like those of the Dark-Sky International organization that promotes the use of eco-friendly lighting at night, have been instrumental in creating awareness of the importance of protecting the night sky. Astrotourism can be a powerful tool to promote dark and quiet skies.

Namibia, known for its exceptionally low global population density, is the perfect location for community-led astrotourism development as it provides unpolluted night skies in most areas for the best part of the year. In the remote Kalahari Desert settlement of Tsumkwe, a pioneering initiative is turning the night sky into a catalyst for community development.

Astrotourism

The Nyae Nyae Conservancy, established by the Jul'hoansi community in 1998, has launched in 2021 an Astro-Tourism Project that offers visitors an experience that combines stargazing with Jul'hoansi storytelling. Tourists can even visualize the legendary ostrich and its feather-to-star transformation via a virtual reality experience, which was co-designed with the community to preserve and share Indigenous star lore. Linked to the UNESCO Chair in Digital Technology Design with Indigenous People at Namibia University of Science and Technology, the project aims to

empower Indigenous groups to control their cultural heritage narrative.

Such initiatives also serve to promote, globally, the importance of protecting our remaining night skies.

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Keeping track of Indigenous knowledge

Through its transdisciplinary Local and Indigenous Knowledge Systems (LINKS) programme, UNESCO is bringing together two of Africa's remaining hunter-gatherer communities to combine Indigenous knowledge with the latest information technology.

In May 2025, UNESCO launched, in northern Tanzania, a series of workshops with members of Tanzania's Hadzabe community and Namibia's Jul'hoansi San community. The training allows them to share their knowledge and test the CyberTracker application – a technology initially developed by South African scientist Louis Liebenberg to record animal tracks, signs, and ecological data.

The Jul'hoansi San and Hadzabe have extensive knowledge of wildlife, tracks, and signs, which they have used to gather food and navigate predators for millennia. The icon-based application is designed for people with little or no formal education, but who are rich in oral knowledge, to gather georeferenced data

about nature. Data collected by expert trackers will be valuable in protecting endangered species, monitoring environmental changes, analyzing trends, and preventing poaching and wildlife trafficking.

The CyberTracker training also encourages elders to share their language and traditions with young people while documenting their interactions digitally. Completion of the training cycle is planned for 2026, after which trackers will be tested on their skills and awarded international certificates of competence.

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