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THE WILDTRACKCUBE-SIMBA CUBESAT: ITALIAN-KENYAN MISSION FOR WILDLIFE  
MONITORING

**Abstract**

The WildTrackCube-SIMBA (System for Improved Monitoring of the Behavior of Animals) CubeSat project has been conceived by Sapienza University of Rome, Machakos University and University of Nairobi to demonstrate an innovative wildlife tracking system based on a nano-satellite project. The mission has resulted winner of the free launch opportunity contest offered by the International Astronautical Federation (IAF) and GK Launch Services in 2019. The proposing team was awarded at the 70th IAC in Washington DC. The spacecraft development is supported by the Italian Space Agency and by the Kenyan Space Agency. The satellite is the third Italian-Kenyan capacity building nano-satellite after 1KUNS-PF (launched in 2018) and LEDSAT (qualified for launch, to be launched in Summer 2021). The use of innovative technology in wildlife tracking contributes to monitoring the animals movement and their behavior, including migrant species. It also helps in early warning, prevention and avoidance of human-wildlife conflict incidents that can result in damage to cultivations or urban areas or even in the death of the animals or humans. Countries like Kenya that have a significant percentage of their surface area covered by a large variety of National Parks have the urgent need to monitor the movements of the animals within the Parks and to set-up methods for preventing the wildlife to cross the preserves

boundaries. The 1U CubeSat carries spread-spectrum modulation antennas for receiving data from the radio-frequency sensors which will be deployed on the wildlife in Kenya. The acquired data will be down linked to the ground stations to allow the biology team to track the wildlife and to study its behavior. The satellite has been qualified in late 2020 and integrated on the launch deployer in February 2021 at the GK Launch Services integration center in Moscow, Russia. The spacecraft is scheduled to be launched on-board the Soyuz-2 Soyuz/Fregat vehicle on March 20, 2021 from the Baikonur Cosmodrome in Kazakhstan. The mission marks an excellent occasion for a capacity building collaboration between Italy and Kenya which will be continued throughout the future years in multiple disciplines such as the development and improvement of space communication systems, biology and ethology. This paper will deal with the WildTrackCube-SIMBA 1U CubeSat mission. After a presentation of the mission space and ground segments, the paper will describe the conducted activities from satellite mission concept to launch and early operations of the spacecraft.