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## frican Jesuits in Science at the Service of the Mission of Christ

History tells us that Jesuits have been at the forefront of major scientific observation and discovery, and not only of the stars. From the revolutionary Jesuit bark, (quinine), to the popular "maté" beverage in South America to present day space exploration as part of the Vatican Observatory team Jesuits continue to find God in the wonders of creation from the vastness of open skies to the minutiae of molecular exploration.

In 2022 for the first time ever, a multi-disciplinary symposium was held in Africama bringing together about 15 scientifically oriented Jesuits with contributions in the natural sciences (physics, chemistry, biology) and formal sciences (mathematics, computer science, data science, artificial intelligence, information technology, systems science, etc). Below we feature three Jesuits dispersed across the globe yet engaged in research that is significant to the continent and the world at large.







## he Voice of an African Jesuit in the Area of Cancer Research

Fr. Michael Otieno, SJ Spanish National Cancer Research Centre (CNIO)



I am Michael Ochieng Otieno, SJ, a Jesuit from Kenya. My interest in cancer research can be traced back two decades when I had a sad experience of cancer that runs deep in my family. Losing my grandmother to cancer motivated me to pursue education at Kenyatta University in Nairobi, specializing in biology with the intention of pursuing cancer biology in the future.

In Kenya, many cancer patients travel to India for treatment because the latter has better facilities and lower treatment cost. There are only 20 cancer oncologists in Kenya most of whom are working in Nairobi and very few researchers. While cancer survival rates have greatly improved in the developed countries, the reverse is true in Kenya.



Currently, I am studying for PhD in Molecular Oncology at the Spanish National Cancer Research Centre (CNIO). My research focuses on the role of DNA and RNA binding protein known as heterogenous nuclear ribonucleoprotein (hnRNP K) in solid tumours. The oncogenic function of hnRNP K has been observed in patients with solid tumours where its increased expression has been associated with poor prognosis. My research focuses on how to develop a small molecule (drug) to prohibit hnRNP K from promoting the development of pancreatic cancer.

The excellent facilities and professors at CNIO will instil in me skills and knowledge, which will enable me to become an important player in cancer research.



## eveloping an Antiviral Against the Deadly African Cassava Virus Disease

Fr. Alain Pitti Djida, SJ Pharmaceutical Chemistry Group, Barcelona

My name is Alain Pitti Djida. I am a Cameroonian Jesuit priest from the West Africa Province (AOC). I am both a chemical engineer (pharmaceutical chemist) and bioengineer (biotechnology). I was missioned to Barcelona to do a PhD in Pharmaceutical Chemistry.

I decided to choose this topic for different reasons. The first is that I wanted to investigate something related to our African continent; the second is because it is easier to develop and test new drugs in plant models than animal models. The title of my PhD is: Design of potential inhibitory compounds of the replication of the "African Cassava Mosaic Virus" (ACMV). I decided to choose this topic for different reasons. The first is that I wanted to investigate something related to our African continent; the second is because it is easier to develop and test new drugs in plant models than animal models.



So, the aim of my work is to develop an antiviral against the virus called African cassava mosaic virus that affects cassava and other vegetables in the world and especially in Africa. The disease caused by ACMV is one of the major problems affecting agriculture in Africa, Latin America, and Asia.



Despite biotechnological advances, the virus continues to cause many losses and a decreased yield in cassava production. Therefore, a sustainable solution to the problem is needed. The direct impact of the results of my investigations would be a significant increase of cassava production in the continent. And I would like to say that it is my way of collaborating for food safety in Africa. 022 www.jesuits.africa

## ondering the Handiwork of God's Creation Through the Lens of a Telescope

Fr. Jean-Baptiste Kikwaya, SJ Astronomer, Vatican Observatory



Fr. Kikwaya, SJ, inside a radio telescope.

I'm Father Jean-Baptiste Kikwaya Eluo, Jesuit, priest, scientist (astronomer) and I have been working for the Vatican Observatory since 2003. I find myself today in Astronomy by the invitation of the Society of Jesus after my studies in Mathematics (Celestial Mechanics) in which I reconnected with my personal interest in the sky and its world of wonders (the moon, the stars, etc.).

I contribute to science through my research on meteoroids (shooting stars). Meteoroids constitute a threat to artificial satellites (for communication, surveillance for security, for the climate, for production of crops, etc.) Experiencing any impact from meteoroids, these satellites could be destroyed. In order to build solid and robust satellites, one has to consider the physical proprieties of the meteoroids (what they are and what they are made of). This was my contribution in studying the density of very faint meteoroids. What I aim to achieve is to keep contributing to science through my research in meteoroids, fireballs, and asteroids that cross the Earth orbit, and we call NEOs (Near Earth Objects).

As recently as September 2022, Dart, a Nasa spacecraft, impacted Dimorphos (160 m in size) to change its orbit around its parent body, Didymos, an asteroid with a size of 780 m. This experiment was conducted as a test to learn whether it would be possible to deflect an asteroid that could cause a threat to the Earth. The ultimate goal of such missions is to protect humanity from extinction due to any impact of another of another celestial body on Earth. Besides the desire to answer questions regarding our origin (how the universe came to be), and also evolution (where the universe is going), astronomy is also engaged in protecting our mother planet and all that it contains. Technological achievements in astronomy (space missions, etc.) help the world to move forward.

Usually, in astronomy, we think about (or imagine) telescopes, and they are important. But for me, to put Africa on the path to research in astronomy, we need first very well-trained astronomers who could accompany students to become astronomers.