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NEWS RELEASE UP student's 'asteroid' discovery recorded in International Astronomical Union database



20 year old Rorisang Mahomo who discovered "Main Belt Asteroid 2023 QY50".

Pretoria - A third-year student at the University of Pretoria (UP) is over the moon after being credited with a provisional asteroid detection that has been catalogued in the International Astronomical Union's (IAU) Minor Planet Center (MPC) database.

Rorisang Mahomo (20) says receiving confirmation that her discovery – provisionally named "Main Belt Asteroid 2023 QY50" – had been recognised in the MPC's database has her feeling "truly happy and in shock".

The <u>MPC</u> operates at the <u>Smithsonian Astrophysical Observatory</u> in Massachusetts, USA, and derives its operating budget from a <u>National Aeronautics and Space Administration (NASA) grant</u>. It typically catalogues around 2 000 provisional asteroid detections per month from thousands of citizen scientists taking part in asteroid search programmes at universities and other organisations around the world.

"Knowing that you discovered a celestial body is a different kind of good news," Mahomo, who hails from Lesotho, says. "It feels unreal. It started becoming real when my phone started buzzing non-stop with Lesotho media reaching out to me."

Journey from EMS to space

What makes Mahomo's discovery even more special is that she is not an astronomy student or even a student in UP's <u>Faculty of Natural and Agricultural Sciences (NAS)</u> – she's studying Business Management in UP's <u>Faculty of Economic and Management Sciences (EMS)</u>.

"My interest in astronomy started when I took a school trip to a planetarium in Bloemfontein," she says. "Seeing planets, stars, galaxies and the solar system really intrigued me, and my passion for astronomy started then. In 2023, during Campaign Week on campus, I saw a gazebo with a telescope and space art, and I knew that's where I have to be. Their posters had words like physics, chemistry, astronomy and mathematics, and I thought only people in STEM [Science, Technology, Engineering, and Mathematics] were eligible to join. However, when I asked if someone like me from EMS could join, they warmly said yes and that we would learn while in the society."

That society was <u>Blue Crane Space (BCS)</u>, a student-led group within UP that focuses on engineering (aerospace), pure mathematics, astronomy and astro/physics, chemistry and theoretical physics.

Keketso Qhomane, Chairperson of BCS, says Mahomo's success was enabled and encouraged by UP's strong focus on transdisciplinary research and collaboration. "The BCS aims to foster innovative ideas among university students, and is also a platform for non-BSc students to gain more experience in astronomy and broader science topics in proportion to their relative fields, whether in marketing, finance, multimedia or any other subject matter."

Discovering 2023 QY50

Mahomo's discovery was made possible by BCS's participation in the International Astronomical Search Collaboration's (IASC) Asteroid Search, an initiative of NASA's Planetary Defense programme.

The asteroid-search campaign she participated in took place from August to September 2023. The IASC provides software and high-resolution astronomical images from professional observatories to citizen scientists around the world, who use the software to analyse the images in search of objects that could be asteroids.

"I downloaded the datasets on 2 September 2023 and immediately started searching using the Astrometrica programme. I identified a movement that matched the description provided by the IASC, and that was the first thing that gave me a bit of certainty that it might be one, even before going deeper into the technical process. I submitted my report [to the IASC via the Minor Planet Center] that same night."

A week after the conclusion of the August/September 2023 campaign, the IASC sent a file listing all the preliminary discoveries of that search campaign. Mahomo's discovery was on the list.

Just over a year later, on 29 October 2024, she received a confirmatory certificate from the IASC, including the provisional name for her asteroid: 2023 QY50.

"I had just finished working on one of my assignments and was ready to go to bed when I received the news from Keketso. The excitement was immeasurable. The first thing I did was to thank God for such an honour! And I quickly called my family to join in the excitement."

She was in disbelief after receiving the news. "It took a whole minute for me to process the news; thinking about how big of a deal this was and that I actually contributed to space science and created new research for scientists. I am truly honoured and overwhelmed. Not only have I made myself and my family proud, but the nation of Lesotho, too."

<u>Professor Chris Theron</u> of the Physics Department in UP's NAS Faculty applauded Mahomo, Qhomane and the BCS for encouraging collaborative research across schools and disciplines. "It is heartening to receive the news of Keketso, BCS and Rorisang's achievements. Their collaboration and success will hopefully inspire students across the country to take part in exciting initiatives like asteroid search programmes. Every contribution of time and effort can lead to discoveries that expand the boundaries of our collective knowledge. Well done, team!"

Mr Heystek Grobler, a part-time lecturer in UP's Physics Department who served in an advisory role to the BCS, said, "Rorisang's remarkable achievement in discovering the asteroid 2023 QY50 is a shining example of what passion and interdisciplinary collaboration can achieve. I am thrilled to see the profound impact of Blue Crane Space, an exceptional student-led initiative, in fostering such breakthroughs. The support and opportunities provided by BCS have been instrumental in empowering students like Rorisang to make a significant contribution to space science. Bravo, Rorisang and BCS – you make us proud!"

Next steps

Qhomane says Mahomo will, as the person who discovered it, be allowed to rename 2023 QY50 – a bit further down the line.

"Rorisang's discovery has been named a provisional asteroid detection, which means the MPC recognises it as a potential asteroid discovery, but requires additional observations," he explains. "Over the next three to five years further observations will be performed to determine the asteroid's orbit and trajectory and gather more data on it. After those follow-up observations, a final confirmation stage happens. The discovery is then officially recognised by the International Astronomical Union, and then it is named by the discoverer."

"I am thinking of giving it my name," Mahomo, who's set to graduate at UP's Autumn Graduations in April/May 2025, reveals. "Scientists usually name their discoveries and theories after themselves, so I think it would be iconic for me to name my first discovery after myself to honour one of my biggest achievements."

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Media enquiries can be directed to Mr Sashlin Girraj - Public Relations & Events Manager

Email: sashlin.girraj@up.ac.za | Cell: +27(0)72 447 3784

ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on its Hatfield Campus in Pretoria. This 115-year-old institution is also one of the largest producers of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country with a Faculty of Veterinary Science, which is ranked the best in Africa. UP has 120 academic departments and 92 centres and institutes, accommodating more than 56 000 students and offering about 1 100 study programmes. It has the most academic staff with PhDs (70%), NRF-rated researchers (613).

The <u>2024 Times Higher Education subject rankings</u> placed UP first in South Africa in the fields of Law, Veterinary Science, Accounting and Finance; Agriculture and Forestry and Electrical and Electronic Engineering. Quacquarelli Symonds (QS) ranked the University among the top five in Africa, as part of their <u>2024 World University Rankings (WUR)</u>. UP was the only South African university featured in the <u>2023 World University Rankings for Innovation (WURI)</u>, falling within in the 101-200 range of innovative universities.

For more information, please go to www.up.ac.za