

# FIRST WOMAN MATH PROFESSOR

BY MAUREEN NAKATUDDU

In Uganda, mathematics has long been regarded as a difficult subject. For decades, it was also a male-dominated academic space. That changed in 2022 when Betty Nannyonga Kivumbi was elected the country's first female professor of mathematics. With four post-doctoral qualifications and a distinguished academic career, she shattered a historic barrier in a field many students fear to pursue.



Prof. Betty Nannyonga Kivumbi

Despite her demanding schedule as a scientist, academic leader and researcher, Prof. Nannyonga has made it a personal mission to mentor young people, especially girls, to embrace Science, Technology, Engineering and Mathematics (STEM). Through the Association of Women Mathematicians Uganda (AWoM), she leads nationwide efforts to change attitudes towards mathematics through mentorship, advocacy and capacity building.

Working with a team of scientists drawn from universities including Kyambogo, Busitema, Muni and Mbarara, Prof. Nannyonga travels across the country to reach students in some of Uganda's most remote communities.

"What makes learners fail mathematics is the poor attitude they have towards it. Once that changes, many begin to appreciate and understand the subject and then they pass."

## REACHING GIRLS

Under AWoM, Prof. Nannyonga and her colleagues have visited Kalangala island where girls paddle canoes to school and Kampala where students are transported by school buses. The contrast is stark, yet the challenges share common roots.

In Kalangala, she encountered girls who miss school during rainy seasons because travel by canoe becomes dangerous.

Prof. Nannyonga notes a reality that undermines attendance and performance.

Beyond weather conditions, the girls face shortages of scholastic materials, pressure to engage in fish trading and early relationships that increase the risk of dropping out. AWoM intervened by encouraging the girls to persist with education and resist pressures that derail their studies.

After the lockdowns in 2020 and 2021 to prevent the spread of COVID-19, government encouraged young mothers and pregnant

girls to return to school in 2022. However, many were hesitant and others lacked parental support. Prof. Nannyonga and her team responded by camping in Mayuge district for two weeks, conducting home visits and holding dialogues with parents at Bunya Secondary School.

The effort paid off. When schools reopened, several young mothers returned to class.

## REGIONAL LEADERSHIP

Prof. Nannyonga's influence stretches beyond Uganda. She is the founder of the Eastern Africa Network for Women in Basic Sciences (EANWoBAS), a regional platform promoting collaboration and growth in mathematics and physics with plans to extend into chemistry. EANWoBAS operates in Uganda, Kenya, Tanzania, Rwanda and Zambia with South Sudan and Ethiopia also participating.

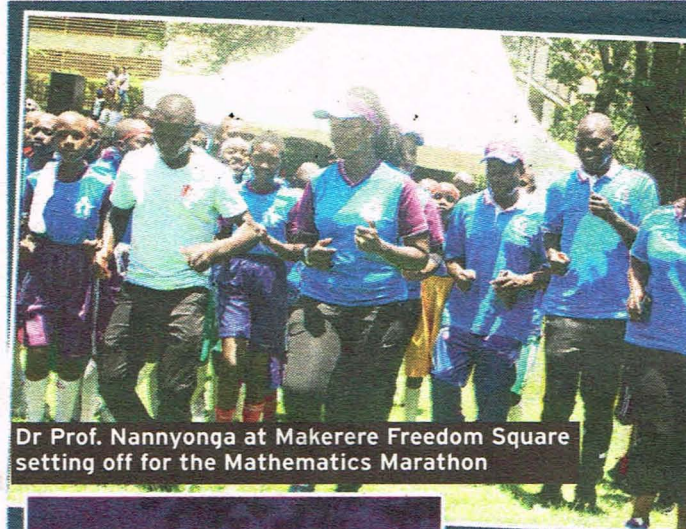
She also founded the Uganda Applied Mathematics Olympiad (UAMO); an initiative designed to nurture young talent, strengthen problem-solving skills and simplify

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**PROF. NANNYONGA SAYS HER GREATEST MOTIVATION COMES FROM THE STUDENTS SHE MENTORS.**

mathematics while promoting gender equity in STEM education.

Prof. Nannyonga observed that despite strong academic ability, girls face persistent barriers in applied learning and innovation. UAMO was designed to reposition mathematics as a practical and problem-solving discipline aligned with Uganda's National Development Plan IV, Vision 2040, the competency-based curriculum and the Sustainable Development Goals. Although boys participate, the focus remains on the girl child.

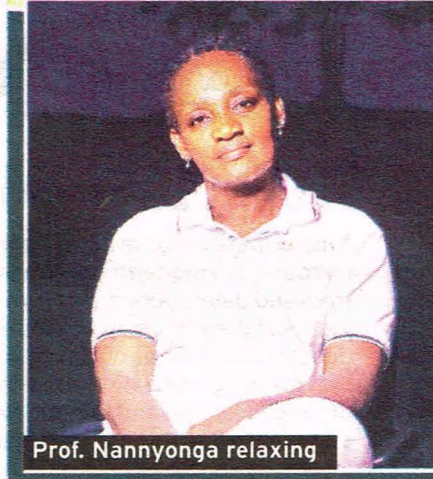
Since 2013, she has also mentored students under the Mastercard Foundation Scholars



Dr Prof. Nannyonga at Makerere Freedom Square setting off for the Mathematics Marathon



With her mother, Theresa Nakaweesa



Prof. Nannyonga relaxing



The EANWoBAS team visited Mayuge and encouraged parents to take their pregnant girls to school

Programme, supporting their academic, professional and personal journeys.

Prof. Nannyonga says her greatest motivation comes from the students she mentors. "Knowing that my work influences lives, especially young girls, keeps me moving even on difficult days," she says.

## ACADEMIC JOURNEY

Among her achievements, Prof. Nannyonga is most proud of completing her doctoral studies in a record time of three years, while simultaneously obtaining a licentiate degree. (The Finnish university system recognises the licentiate as an advanced qualification within doctoral training, demonstrating deep research competence even before completion of a PhD.)

"That period transformed me completely in mathematics. It taught me focus, discipline and the ability to remain strong amidst challenging situations."

In 2020, Prof. Nannyonga applied her skills in biomathematics while working with the Ministry of Health

# URGES GIRLS TO PURSUE SCIENCES

## WHAT OTHERS SAY

Dr Olivia Nabawanda, a mathematics lecturer at Mbarara University, describes Prof. Nannyonga as a mentor, who uplifts other women. She credits her with helping young academics adapt, build confidence and engage with wider professional networks. "She is in a field where there are very few women. If she made it, I can also make it," Nabawanda says.

In Kalangala district, the Bukasa Secondary School headteacher Matthias Ssembwayo, says mentorship from women scientists transformed academic outcomes. In 2021, the school recorded its first two female students with first-grade results at Uganda Certificate of Education level. "They told the girls that in spite of the hardships they face, the rewards of education are immeasurable," he says.

Professor Nannyonga continues to rewrite what is possible for girls and women in mathematics, one student and one community at a time.



Dr Olivia Nabawanda

during the COVID-19 pandemic. She helped model data for decision-making, particularly in identifying areas requiring targeted vaccination intervention. "My physics and mathematics came into play in locating such areas," she explains.

## ENSURING BALANCE

To manage her many responsibilities, she relies on structured routines and faith. Attending Mass before work grounds her and provides spiritual balance. She intentionally schedules time with her immediate and extended family, including weekly meetings with her siblings who run a liquid soap business together.

"My siblings and I meet once a week to make soap and also see how the business goes," she explains. She adds that this has allowed them to stay connected and support one another.

Exercise, such as walking and jogging helps her relieve stress, while occasional self-care activities ensure emotional and mental well-being. She believes that balance is

essential for effective leadership and long-term impact.

## LESSONS, INSPIRATION

Prof. Nannyonga draws inspiration from her mother, Theresa Nakaweesa Kivumbi, whose strength and support shaped her resilience. She also credits the now deceased Prof. Livingstone Luboobi for academic mentorship and acknowledges international scholars and institutions that broadened her exposure. She also emulates David Sumpter, a professor of applied mathematics at Uppsala University and the author of the *Ten Equations that Rule the World*. The International Science Programme, for providing opportunities through funding in research and exposure, inspired Prof. Nannyonga to take a deep dive into the mathematics subject.

Growing up in a large family instilled discipline and accountability. "Our father ensured holidays were not periods of idleness, but growth opportunities," she recalls,



Prof. Nannyonga taking time to pamper herself

adding that responsibility and purpose were deeply rooted in their upbringing. All 14 siblings went on to graduate and succeed in their respective fields.

She admits that earlier in life, she underestimated the importance of delegation and asking for help.

"I took on too much responsibility," she says, adding that she has since learned to combine initiative with teamwork, making her more effective in leadership.

Her favourite book is *The 7 Habits of Highly Effective People* by Stephen R. Covey. The phrase "begin with the end in mind" guides her approach to life and work.

## A VISION FOR WOMEN

If she could change one thing for women, Prof. Nannyonga would ensure equal access to education and opportunities, particularly in STEM fields.

"I would like to leave a legacy of empowerment through education. I want young people, particularly girls, to be inspired to innovate, solve real-world problems and contribute meaningfully to Uganda's development," she says.

She envisions expanding UAMO to every secondary school, bridging the gender gap in STEM and driving national development through applied mathematics. She hopes to be remembered as someone who created opportunities, broke barriers and showed that knowledge, creativity and resilience can transform communities.

If she had 20 minutes with a celebrity... President Yoweri Museveni and First Lady and Minister of Education and Sports Janet Museveni are the people Prof. Nannyonga would like to spend this time with.

"I aim to demonstrate how deliberate innovations in mathematics through the UAMO can transform science education, promote gender equity in STEM and make mathematics more accessible across Uganda," she says.

"While science often receives strong emphasis, mathematics is frequently overlooked, yet it is truly the queen of science; by prioritising mathematics, promoting science becomes far easier."

## EDUCATIONAL BACKGROUND, PROFESSIONAL PROFILE

### EARLY EDUCATION:

- Attended Clement Primary School Ntusi for lower primary.
- Completed upper primary at Blessed Sacrament Kimanya.

### SECONDARY EDUCATION:

- Studied O'level at Christ the King Secondary School Kalisizo.
- Completed A'level at Trinity College Nabbingo.

### UNDERGRADUATE AND POSTGRADUATE STUDIES:

- Obtained a Bachelor of Science in Mathematics and Physics from Makerere University.
- Earned a Master of Science in Mathematics from Makerere University.
- Completed a Licentiate degree in Mathematical Bioeconomics at Uppsala University.
- Attained a PhD in mathematics through a joint (sandwich) programme between Makerere University and Uppsala University.

### POSTDOCTORAL QUALIFICATIONS

- Mathematics Education - University of Cambridge.
- Mathematical Bioeconomics - Uppsala University.
- Biostatistics - Linköping University.
- Biomathematics - African Institute for Mathematical Sciences.

### PROFESSIONAL ROLES AND RECOGNITION

- Serves as an ambassador on the Committee for Women in mathematics under the International Mathematical Union.
- Inducted into the Uganda National Academy of Sciences in 2017.
- Board member of the National Identification and Registration Authority (NIRA).

## PROF. NANNYONGA AT A GLANCE

### 1 Skin care regimen

Every woman desires to look good. Prof. Nannyonga says her secret for skin care is using a sugar scrub for gentle exfoliation and turmeric for its brightening and anti-inflammatory properties. She also uses petroleum jelly on her face, which she says keeps it smooth.

### 2 Craziest thing for love: The craziest thing Prof. Nannyonga has ever done for love was using mathematics to plan a surprise for someone special. "I calculated the best timing, co-ordinated logistics and optimised every detail to make the gesture perfect."

### 3 One thing for women to change:

If Prof. Nannyonga could change one thing for women, it would be to ensure equal access to opportunities and resources, particularly in education and STEM fields. When women thrive, she observed that communities and nations thrive.