AFRICAN MATHEMATICIANS WOMEN
A PORTRAIT GALLERY

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Contents

Foreword

Mathematics, referred to as the Queen of all Sciences and one with a long and rich history, governs almost every other discipline of knowledge. Unfortunately, this queen is deserted by the youth. Besides being seen as a difficult subject, it is also perceived as an exclusive domain for men. Even worse, there is a prevailing myth in Africa that girls aren't good at maths and science. This perception has been created by all, including press and popular media. Who hasn't heard a lamentation or an excuse of the kind – **"**I was awful in maths; I ended up hating it ... **".** This attitude of society towards mathematics has a strong negative effect on young students and keeps pushing them away from mathematics and related fields. The only thing that works in favour of mathematics is somehow discovering the enjoyment mathematics can provide; this usually happens when one meets the right person (teacher, scholar or a book) to inspire and help unveil the beauty of mathematics.

In view of these well-established and widely accepted ideas, we are called to act effectively. By this project of portraits, we aim to highlight women mathematicians in Africa and further to provide role models for school girls and young women in their early stages in the field of mathematics, and ultimately to give the future generation of women the right to dream and to claim their place in this traditionally male-dominated arena.

I am proud and grateful to the women who agreed to participate in this project of portraits by kindly responding to the questionnaire. This first portrait gallery of African mathematicians women, enriched with positive messages of the elders, has been an inspiration to me and I am confident it will be so to many school girl scholars and those already in the universities

who will get the chance to read it. Indeed, after a first reading of this portrait gallery, some words and phrases will for sure provoke a compelling desire to read it again and again. Central to all of the successes of the women featured in this booklet are: their passion for mathematics, their determination, their commitment to work hard, to excel in what they do, their readiness to contribute in bringing solution and improving life in a continent facing a variety of problems, their desire to challenge traditional stereotypes regarding women in mathematics, their wish to coach and support girls and other women so they won't have to deal with most of the obstacles they themselves had faced.

My words of appreciation and thanks go to each mother, father, husband, teacher, mentor,... whose support has been crucial in overcoming challenges and who have contributed in the success of these women, such as expressed, for example, in the following statements:.

"My dad provided my fees when he hardly could, did fundraising when I got university admission to do mathematics"

"I thank my husband for the support he gave me to achieve my dream of being a qualified Mathematician"

"I have come to believe strongly that mentoring plays a key role in career development in any and every field of endeavor".

Finally, I am very hopeful when I read these inspiring statements that let me foresee a better future for women in the field of mathematics.

"Being a woman gave me certain strength of character that allowed me to overcome obstacles and continue today a career in mathematics"

"I believe the memorable experiences are yet to come"

"My biggest achievement in my career is the joy of seeing students who have lost hope in Mathematics turn around and with good performances"

"I am fascinated by the fact that Mathematics can be used to solve real life problems."

Let me finish with this motivating quotation from Joshua J. Marine:

"Challenges are what make life interesting and overcoming them is what makes life meaningful"

and with a cordial invitation to all African mathematician women to share their stories and experiences with us for future booklets.

Professor Schehrazad Selmane

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IMU-CWM Ambassador - Algeria
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African Women in Mathematics Association

AWMA

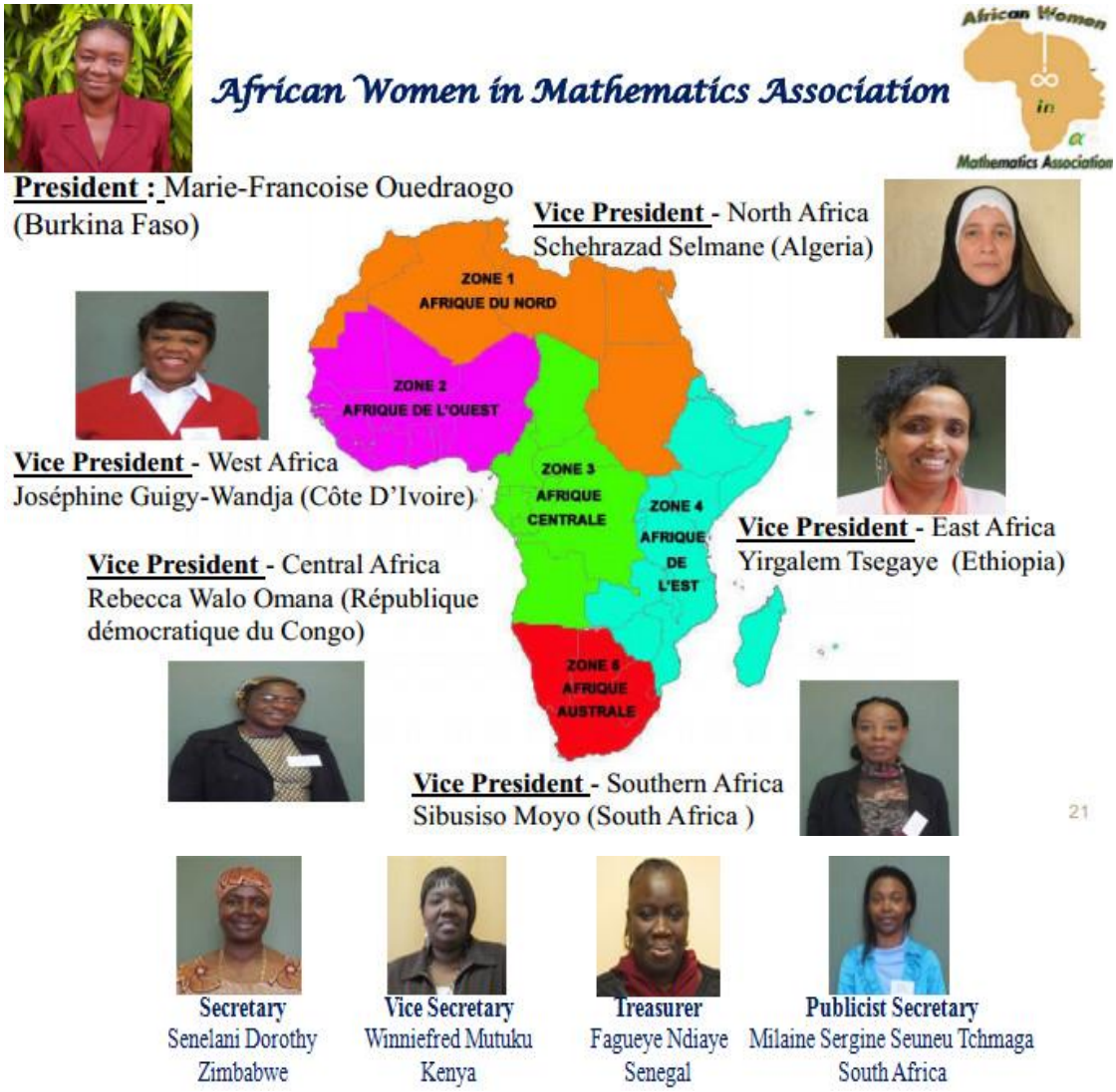
Created in 2013 at Cape Town in South Africa from the desire and demand of African women mathematicians, AWMA is an association whose main aim is to promote women in mathematics in Africa and promote mathematics among young girls and women in Africa. Since its creation, we organized workshops for women mathematicians starting by the first workshop in Ouagadougou (Burka Faso) on 2012, followed by three other workshops, Cape Town (South Africa) on 2013, Naivasha (Kenya) on 2015, Rabat (Morocco) on 2017. These workshops led also to the creation of some national associations in some countries. In addition to these events, AWMA is developing other activities such as:

- update the database of women with doctorate degree in Africa.
- make booklets with women mathematician in Africa as role model for young girls
- organize scientific workshops, schools or conferences in specific areas of mathematics
- have a meeting in a central African country.

AWMA also participates in the Committee of Women in Mathematics (CWM) of the International Mathematician Union (IMU).

All these activities initiated by AWMA are intended to help African women mathematicians and those wishing to engage in mathematics, especially to overcome the difficulties mentioned above to achieve their goal.

Dr Marie Françoise OUEDRAOGO



ATINUKE ADEBANJI

My dream is to help girls and women under my supervision so they won't have to deal with most of the obstacles I faced

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Education

- **1990 :** BSc Statistics. University of Ilorin, Nigeria
- **2001 :** MSc Statistics. University of Ibadan, Nigeria
- **2006 :** PhD Statistics. University of Ibadan, Nigeria
- **2016 :** MPH. Population, Family and Reproductive Health, Ghana

Professional experience

- **Feb-Aug 2017:** Senior Research Fellow, Institute of Mathematical Sciences (ICMAT), Spain
- **Since 2013:** Associate Professor at KNUST, Department of Mathematics, Kumasi, Ghana
- **2009 – 2013:** Senior Lecturer, Department of Mathematics, KNUST, Kumasi, Ghana
- **2005-2009:** Lecturer, Department of Statistics, University of Agriculture, Abeokuta, Nigeria.
- **2003-2005:** Assistant lecturer, Department of Mathematics, University of Agriculture, Abeokuta, Nigeria.
- **1992-1994:** Trainee Accountant, UAC Nig PLC.

Honours and prizes

- Mujeres Por Africa Senior Science Researcher's fellowship for six months visit to ICMAT, Madrid; 2017
- Lead facilitator: 750,000 Euros National Institute of Mathematics (NIMS), Ghana, research/teaching grant awarded by Petroleum Geo-Services (PGS) and Norwegian Academy of Science and letters; 2013-2016.
- Organization for Women in Science for the Developing World postgraduate fellowship; 2005.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

I loved reading and mathematics in the elementary school. I read a lot from my mother's encyclopedias and often went to our 11eighbor's (Dr Elukpo) house to read the story books in his children's library. I found mathematics easier than other subjects and I scored very good grades in the subject. My interest however, waned in the third to fifth year in secondary school because I could not connect with the teachers who during that period were foreigners and had an accent which I was not familiar with. I however totally enjoyed and loved my statistics classes because the lecturer was full of life and it was impossible not to look forward to his classes. During my A levels, my interest in Mathematics was rekindled and I went on to pursue a BSc in Statistics from at the University of Ilorin from 1986 to 1990. I thoroughly enjoyed my degree programme and was motivated by some of my lecturers. This further fuelled my passion for academics.

My parents were completely opposed to the idea of a woman in Mathematics. This explains my career starting in the industry and later

returning to postgraduate studies and a career in Mathematics 9 years after obtaining my first degree. So I can be described as a late starter in academics.

I love to teach and I find teaching quantitative subjects very appealing because they follow logical reasoning.

What fascinates you about Mathematics?

Mathematics is a multifaceted beauty. Whatever side of her you choose to focus on opens a whole world of discoveries.

Has anyone influenced your decision to become a mathematician and how? Has anyone supported you in your choice and during your career?

My parents totally opposed my being in Mathematics neither did my husband find my quest sensible. One of my lecturers in the undergraduate (Prof Jolayemi) encouraged me to pursue academics, but the main influential figures were my PhD supervisors, Profs J.O. Iyaniwura and S.K. Nokoe. They taught me to push, and Nokoe placed me on his huge shoulders so I could stand tall from start. I always wanted to be an academician and I am much fulfilled to be one today.

There are people who have shaped my career. Most especially, Prof Sagary Nokoe, who mentored several early career Nigerian mathematicians. He was personally involved and often pushed me beyond my presupposed limits. His mantra is “believe in yourself”. He is still my mentor. Another person of influence in my career is Prof Wandera Ogana of Kenya. He always brought openings and possibility of grants to my notice. He is an excellent mathematician that I have a great deal of respect for. Late Prof Allotey also played a prominent role in the lives of Mathematicians in West Africa. He was remotely involved in my early career through the workshops he regularly organized for postgraduate students and young academics. I am currently

being supported by a terrific female Prof of Food Technology who is also my Provost, Prof Ibok Oduro. She observed that being the only female and also a foreigner in our Department of Mathematics was making me feel isolated and dampening my vim to do new things. She extended her support and together with some other females we have birthed the Women in Science, Technology, Engineering and Mathematics (WiSTEM) in Ghana.

I have come to believe strongly that mentoring plays a key role in career development in any and every field of endeavour and I seize every opportunity to mentor any available and willing mentee.

Were there any specific factors that helped you succeed? Would you see it was easy for you to enter your field, and ultimately excel? What challenges did you encounter on the way?

The key factors that have helped me in my own career would be my trust in the goodness of God in sending me some destiny helpers; resolve to pursue my dreams despite initial resistance from my parents who were both well educated, and an unsupportive partner; accessing career development opportunities; hard work and tenacity. I wouldn't say it was easy entering my field nor has it been any easier staying in it. In this part of the world, a career in Mathematical Sciences is still largely seen as a male territory unlike other places. Being a female means working double hard to justify your being there. This might also result in more animosity but there are a few males who believe in female mathematicians but these crops of persons are far in between.

One challenge I have consistently encountered is not being recognized for my contribution. The credit often goes to the male. Another major challenge for me was the age limit placed on several career development opportunities excluded a late starter like myself. I came into academics at 35 and most

opportunities had early 30's as the age limit. The only one I enjoyed which seemed sensitive to women lagging behind was OWSD. I had a fellowship on OWSDs and it's been a catalyst for my career development.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

The funniest I can recall was the confusion on my middle name at COMPROMAPH2 workshop in Cotonou, the Republic of Benin in 2004 or 2005. My middle name Olusola is unisex in Nigeria, and the letter of invitation had said we would be paired in our hotel rooms, so the organizers assumed I was male and paired me with another Olusola who happened to be male. I arrived and was directed to my room only to find a male who had apparently observed the error from my first name but didn't prompt the organizers because he wanted to have a good laugh. I was reassigned but the little drama was retold in very different versions and I couldn't shake off the 'tag' the entire programme.

Career and Family

Do you come from an academic family? How does your family regard your career choice? Is it hard to manage both career and private life? Do you have kids? Tell us about balancing family life with work life?

I am the third of nine children and was always the family's nerd. Some of my siblings also have second degrees but my family is not academic though both parents were well learned. My parents did not agree to my interest in pursuing a career in Mathematics most probably because they assumed such women would be too tough and no man would want to marry them. My mother did not live to see me in academics but my father did. He was very proud of me and apologized for their interference in my career. My children

and my siblings are also very proud of how far I have come given the challenges I have had to overcome. Experiences differ, so it is not a one size fits all when it comes to what works. I however would recommend a very good support system from either family or spouse/partner or close friends. It could prove a major challenge if you find yourself far from home in academics raising young kids with a spouse who thinks you should spend more time in the kitchen than at your study desk. We are divorced today not because either of us was bad, but because of socio-cultural barriers which he couldn't overcome mentally. It is almost a taboo for a woman to have better qualifications than the husband where he comes from and there was a lot of extended family pressure on him to make a 'woman' of his wife. I did try to fit in the mould and yielding to my parents and that had it cost me 9 years. When I got a second chance, there was no going back for me.

It would still be a bit hard managing career and family, but it would be less stressful with a good support system. I have a number of female colleagues who have supportive spouses and they are doing very well.

I have 3 children; a girl of 24, and 2 boys aged 21 and 11. My oldest child was 6 when I went back to school for postgraduate studies. My youngest was born shortly after I completed my PhD. My daughter completed a BSc Geological Engineering and about to defend her Master's thesis in Water resource engineering and environmental management. My older son is about graduating with BA Political Studies and my 'postdoc baby' is in grade 7 and he is the family's nerd.

One key ingredient in my coping strategy when they were younger was to have a work-space at home. I did as much as I could from home. This helped keeping me perpetually involved in my children's lives. I also did and still do the school runs except I am out of town.

I have kept my life uncluttered and my social cycle deliberately quite narrow because it suits my temperament and works better for me being a single parent. I wouldn't recommend this to an extroverted woman though.

With my kids older, things have become a whole lot easier when it comes to managing the home, although the demands have become more financial. We should always have a little bit of pressure in our lives else things will become too boring I would say.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? What kind of prejudices, if any, did you have to face? How did that make you feel? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

The biggest obstacles were stereotyping and not being recognized for one's competences. I did and still do have the impression that it would have been a WHOLE LOT EASIER if I were male. When a woman progresses in a male dominated career here, it is often explained away by 'you never know who she has had to bed' etc. I find it extremely infuriating. I have had to overcome it by making sure I am one of the best around in my field. I am presently the only female Mathematics Assoc Prof my university has produced in over 60 years of existence. It's not easy, but it's the only legit way to show you are all about business.

What I would like to draw your attention to is the middle to late career women. They seem to have been pretty much forgotten. Virtually all the opportunities are targeting early career women, which is not right. Middle-late career women should be exposed to training on management and how

they can inform national policy. This in my opinion is the peak of most careers.

Did you encounter any specific difficulties relating to the field of mathematics?

In middle secondary school, I didn't enjoy mathematics much because my teacher had a barely audible voice and spoke to himself most of the time. I was one of the tallest in class so I sat close to the back. It was pretty bad. Most of my teachers at the university were quite good with the exception of a few who seemed to treat mathematics as an enigmatic phenomenon. Therefore, if the teacher isn't passionate about the subject, he can't make disciples of the student. The teachers' competence and skill especially at the lower schools goes a very long way in making students love or have apathy towards mathematics. Things changed when I got older, I probably have been fortunate to have visited institutions that had almost all I needed. There's also our education system here, which is still predominantly content and not enquiry based. This keeps us behind and our products not being able to compete fairly on the global stage. I do believe that Staff training and re-training is essential.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I am an OWSD fellow and I have had a wonderful time with OWSD. They have room for both early and late starters. I have had a very good exposure through OWSD and collaborated with other members. I am also a founding member of WiSTEM Ghana which is in its infancy stage. Through WiSTEM, I have met a lot of other women in my University that I would probably not have met. We also work together to mentor females in our University and in

the communities around our University. I believe no female should pay the price I have paid to pursue her dreams in mathematical sciences.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Absolutely necessary. We should also promote female role models especially in communities that have tradition and culture influencing a lot of their decisions.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

Teaching mathematics can sometimes be a challenge, especially when the audience cannot relate the content, getting them involved in hands on exercises often works. Especially, when it is kept lean on mathematical jargons. I have often used non conventional methods to teach some mathematics concepts, for instance using the movie on Erin Brockovich to teach data collection for scientific research and inferring from empirical evidence.

How would you explain your research to a layman?

I would say that my area of mathematics looks for information in data and how this can be used to improve the lives of the population especially on health related issues.

Can you tell us about the applications of your research, if any?

Patter recognition (spatio-temporal), Analyses involving high dimensional data, assessing the effectiveness of maternal and child health interventions.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement is my children and my biggest failure is a marriage that ended in a needless divorce.

Do you have a dream?

My dream is to reproduce several of myself who won't have to deal with most of the obstacles I faced. I have managed a few, but I want them in their hundreds so that the inverted funnel of women in mathematics can be filled and ultimately become a cylindrical shape.

If you had the option to give advice to a younger version of yourself, what would that be?

I would say know yourself, follow your dream come what may, and never say yes to a man who can't share your dream or a man who can't celebrate you.

Zamurat Ayobami Adegboye

I discovered my passion for mathematics when we were given an assignment and I could not sleep until I got the problem solved

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Education

2009 – 2014 : PhD Pure and Applied Maths. Nigerian Defence Academy, Kaduna.

2005 – 2008 : M.Sc. Pure and Applied Maths. Nigerian Defence Academy, Kaduna.

1991 – 1995 : B.Sc. Pure and Applied Maths. University of Ilorin, Ilorin Kwara State.

1988 – 1990 : Advance Level IJMB. Kwara State Polytechnic, Ilorin Kwara State.

Professional experience

2018 to date : Senior Lecturer. Federal University Gusau, Zamfara State, Nigeria.

1997-2018: Asst. Lecturer – Chief Lecturer. Kaduna Polytechnic, Kaduna, Kaduna State, Nigeria.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

Mathematics was my favorite subject when I was in high school and I always took first position in the subject. I discovered my passion for mathematics when we were given an assignment and I could not sleep until I got the problem solved. I decided to be a mathematician when I was about to finish high school in 1988.

What fascinates you about Mathematics?

The confidence exhibited by my high school mathematics teacher whenever he is teaching the subject.

Has anyone influenced your decision to become a mathematician and how?

Yes, my high school mathematics teacher, by creating confidence in me, encourage me participate in inter-school mathematics competition. My University project supervisor, he taught me how to make good research in mathematics. And my research advisor who, encourage me on publication issues.

Has anyone supported you in your choice and during your career?

Yes, my parent and National Mathematical Centre Abuja, Nigeria.

Were there any specific factors that helped you succeed? Would you see it was easy for you to enter your field, and ultimately excel? What challenges did you encounter on the way?

Interest and determination. Yes, very easy with interest and determination. One of my challenges is how to understand very well some abstract aspects of mathematics like real analysis and so on.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

My funniest moment happened when I was in high school. We were given home work and all members of my class tried to solve the problem. We couldn't While sleeping on my bed I was thinking of solution and when got it right, I have wake my bunkmate up that midnight telling her I have just got the answer to my home work and I need to write it down on paper. I made sure I wrote it down on a sheet of paper and we both went back to sleep.

Career and Family

Do you come from an academic family? How does your family regard your career choice? Do you have kids? Tell us about balancing family life with work life?

No. My family regarded it as okay but not special.

Yes, I have kids. I make precious and strict use of my time for work. I also try as much as possible to avoid overlap between both when planning. So I don't find hard to manage both career and family.

Women and Mathematics

What were the biggest obstacles you had to overcome? Do you have anything else that you'd like to tell us about?

My biggest obstacle is understanding abstract mathematics. I felt bad the day I gave my student test, and they all failed the test. Repeat the lecture using a different method of teaching.

Tell us about the organizations for women mathematicians that you are a part of?

World Women in Mathematics, African Women in Mathematics, West African Women in Mathematics and Nigerian Women in Mathematics.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

Start by simple examples if possible.

Can you tell us about the applications of your research, if any?

All model real life problems can be solving via numerical method. I am into numerical analysis.

Conclusion

What are your biggest achievements, and what your biggest failures?

I have acquired good knowledge in mathematics but I have not impacted it enough. I have just gotten appointment into university were I could make use of my acquired knowledge.

Do you have a dream?

Yes. My dream is to be in a mathematical research institute.

If you had the option to give advice to a younger version of yourself, what would that be?

Be determined to do Mathematics well and be interested in it.

Folake Akinpelu

My dream is to become a notable Mathematician

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Education

- **1991 :** B. Sc. Mathematics
- **1997 :** M. Sc. Mathematics
- **2004 :** PhD Mathematics

Professional experience

1993 to date Teaching at Ladoke Akintola University of Technology.

Questionnaire

Your story with mathematics

Can you tell us something about your story? How did you discover your passion for mathematics? When have you decided to be a mathematician and why?

I love Mathematics right from my secondary school day. During my secondary school days my classmates asked me to solve problems for them.

When I got admission into university and had two options between Physics and Mathematics, I choose Mathematics because of the interest I had for Mathematics.

Has anyone influenced your decision to become a mathematician and how?

Yes, one of my Ghanaian Mathematics teacher and my mother because of her words of encouragement.

Has anyone supported you in your choice and during your career?

Yes, My mother and some of my friends.

Were there any specific factors that helped you succeed?

Access to mathematics Materials and tools to work with.

Was it easy for you to enter your field and what challenges did you encounter on the way?

Yes, there are some areas in mathematics whereby I lacked qualify lecturer to teach the course.

What is the funniest thing that has happened to you while working in mathematics?

The funniest thing that happened to me was at a time I tried to solve a problem and I missed a step at the beginning thinking that I have gotten a solution to discover at the end the solution is wrong.

Career and Family

Do you come from an academic family?

No, I don't come from an academic family but my choice of career was seen as a thing of pride to the family.

Is it hard to manage both career and private life? How do you manage both?

Yes it is hard to manage both career and private; I try to strike the balance.

Do you have kids? Tell us about balancing family life with work life?

Yes, when am with my family I forget about my work life and face my work in the office so that nothing will hinder one another.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? What kind of prejudices, if any, did you have to face? How did that make you feel? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

The biggest obstacle I had to overcome is to believe that I have the potential and I should not be intimidated. Initially, I have the impression that it would be easier if I am a man in the sense that nothing distracts him because woman must take of her home and combine with her career.

The prejudice I had to face is that the same criteria are used for both the male and female it makes me to put in extra effort. Yes the same criteria should not be used when it comes for promotion.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

Nigeria Women in Mathematics

West African women in Mathematics

African Women in Mathematics Association

These organizations has enabled me to know how to alleviate fear in the heart of the students (female)

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Yes, we must encourage them at the secondary school level by giving them scholarship to university level.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

By using play way method, by allowing the students to express themselves and not scolding.

How would you explain your research to a layman (non-specialist)?

My area of research is into analytical dynamics where road construction and bridges are been discussed. To a layman the materials needed for construction must be considered both in quantity and quality, frequency, the critical velocity, the stiffness, the shape axial and the compressive forces of the structure.

Can you tell us about the applications of your research, if any?

Construction of buildings, bridges and roads.

Conclusion

What are your biggest achievements, and what your biggest failures?

I have ninety-three (93) citations, nine hundred and ninety-five (995) read and eight (8) recommendations of some of my publications.

Do you have a dream?

Yes, my dream is to become a notable Mathematician.

Which advice would you give to young girls who want to engage a career in mathematics?

They should not have phobia for Mathematics. Mathematics is no longer x and y, it is very interesting and applicable to real life problems.

Mary Durojaye

Solving maths problems became a passion especially with the joy I derive when I eventually arrive at the answer for some very difficult exercises though sometimes it spanned through a long time

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Education

- **2010 :** Ph.D. Applied Mathematics. LAUTECH, Ogbomoso, Nigeria
- **1995 :** M.Sc. Mathematics. ATB University Bauchi, Nigeria
- **1991 :** B.Sc. Mathematics. University of Ilorin, Nigeria
- **2014:** Post- Doctoral Research. Tshwane University of Technology, Pretoria
- **2004 :** Doctoral Research Studies. Centre Automatique et Systèmes, Ecole des Mines de Paris, Fontainebleau, France.

Professional experience

- Senior Lecturer (Mathematics). University of Abuja, Abuja, Nigeria.
- Research Fellow (Mathematics). National Mathematical Center, Abuja, Nigeria
- Senior Lecturer (Mathematics). Federal Polytechnic, Bauchi, Nigeria.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

My interest in Mathematics started from my elementary school days. Then my father made me believe that Arithmetic was the bedrock of all learning. By this I determine to attain excellence in my arithmetic class. This made me to ensure that I attended to all exercises under every topic treated in school.

This continued to my secondary school days where I spent a good part of my nights on solving exercises on Mathematics, including the ones that my Teachers could not resolve in the classroom.

This then became a passion especially with the joy I derive when I eventually arrive at the answer for some very difficult exercises though sometimes it spanned through a long time.

What fascinates you about Mathematics?

The fact that if you keep your hands on a particular problem no matter how difficult it looks, applying the right formula carefully, you will eventually get the right answer.

Did you have a role model that influenced your decision to become a mathematician? Or has anyone influenced your decision to become a mathematician and how?

Yes, my father from the beginning of my education motivated me. Then teachers along the line encouraged me by the good commendations they gave each time there is an exceptional performance.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

I remembered my third year in high school when my teacher gave a test on some problems on surd. None of us got the answer and when the teacher was to give the correction, his answer after much struggle did not agree with the one on the textbook. At the end he said the textbook was wrong. But I was not satisfied with his submission, so when the school closed for the term I continued to work on this same problem seeking for help from other textbooks and senior students. Eventually, I stumbled on the right method and discovered the error that caused the wrong answer. Then the correct answer came which was in agreement with the textbook. When the school resumed the next session, I presented the answer to my teacher who was so amazed to discover that I continued to work on the problem for that length of time.

Career and Family

Do you come from an academic family?

I am not from an academic family. My father was a priest in the church.

Is it hard to manage both career and private life? Do you have kids? Tell us about balancing family life with work life?

Managing both family and career is a major challenge. I have my husband and four (4) children to attend to. When my children were younger I had to most of my academic/ research work at night and spend the day time for office and family attention.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male?

For me there were no particular obstacles that made me feel it would be easier or harder if I were a male.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

The Nigerian Women in Mathematics is doing very well and giving women mathematicians a voice and a sense of belonging.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Special programs for promoting Mathematics in schools should be highly encouraged towards reaching out to girls and motivating them to develop careers in Mathematics.

Incentive schemes can also be introduced to motivate girls into choosing the career.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

My strategy has always been first to remove 'the Mathematics Phobia' from my students. Most students are as bad as they appear to be in Mathematics but along the line have been captured by the phobia for Mathematics. Oh, it is a hard subject; you can never do well in it.

Also I try as much as possible to introduce every problem with practical/life applications in order to catch the attention of my students.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement in this career is the joy of seeing students who have lost hope in Mathematics turn around and with good performances by this motivation

Which advice would you give to young girls who want to engage a career in mathematics?

To pursue the career in Mathematics with all vigor because it is rewarding.

Olubunmi Abidemi Fadipe-Joseph

I established the Fadipe-Joseph Prize in Mathematics for the best female student in Junior Secondary Schools

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Education

- **2005 :** Ph. D. Mathematics, University of Ilorin, Ilorin, Nigeria
- **1999 :** M. Sc. Mathematics, University of Ibadan, Ibadan, Nigeria
- **1995 :** B. Sc. Mathematics (First Class Honours), University of Ibadan, Nigeria

Professional experience

- **2001-date:** Lecturer. Department of Mathematics, University of Ilorin, Ilorin
- **2014-2015**: Senior Lecturer. Department of Mathematics, Landmark University, Omu Aran (Sabbatical leave)
- **1997 – 2001**: Lecturer. Department of Pure and Applied Mathematics, Ladoke Akintola University of Technology, Ogbomoso
- **1995 – 1996:** National Vocational Academy, (NAVAC), Abiriba, Abia State, (National Youth Service Corps).

Honours and prizes

(i) Prize for the best lecturer in the Department of Physical Sciences, Mathematics Programme, Landmark University, Omu Aran (2015).

(ii) Staff Development Award, University of Ilorin, Nigeria (2004-2005).

(iii) First of all First Class (Honours) in Mathematics, University of Ibadan, Ibadan, Nigeria (1995).

(iv) The Adekunle Kukoyi Prize in Mathematics, University of Ibadan, Ibadan, Nigeria (1995).

(v) Prize for the best overall student, Department of Mathematics, University of Ibadan, Ibadan, Nigeria (1995).

(vi) Prize for the best overall student, Ogbomoso High School, Ogbomoso, Nigeria (1988).

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics?

I had wanted to be a teacher from primary school because my parents were teachers.

As I grew up, I preferred to engage in teaching and researching in Mathematics.

What fascinates you about Mathematics?

I love calculations at the elementary stage and I feel bored if there are no figures to play with in documents

Has anyone influenced your decision to become a mathematician and how?

My parents influenced me to become a mathematician.

My father taught me Arithmetic after school hours, so I have a good background in Mathematics.

Has anyone supported you in your choice and during your career?

Yes, my parents and a teacher at high school.

Were there any specific factors that helped you succeed? Would you see it was easy for you to enter your field, and ultimately excel?

Encouragement from parents and a conducive environment. It was not so easy as a woman since I was always a minority in the class of men.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

Some people look at women as weaker vessels but I have proved them wrong by my achievements. For example, I graduated with first class honors from University of Ibadan, the first University in Nigeria

Career and Family

Do you come from an academic family? How does your family regard your career choice?

Yes, my parents were teachers. My family regards my career as the best I can be.

Is it hard to manage both career and private life?

With determination one can manage both career and private life.

Do you have kids? Tell us about balancing family life with work life?

I have three children. I plan my time properly so that the family life and work life do not suffer. Occasionally, my children stay with me in the office after their school hours when they were very young.

Women and Mathematics

What were the biggest obstacles you had to overcome? Were you able to overcome these?

The biggest obstacle I had was the burden of combining work life with family life especially when I was nursing children. It would be easier if I were a male. I was able to overcome the obstacle because of the support from my parents and spouse.

Did you encounter any specific difficulties relating to the field of mathematics?

Yes, availability of resources and lack of mentors

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

Ambassador, International Mathematical Union, Committee for Women in Mathematics

Commissioner (West Africa), Africa Mathematical Union – African Women in Mathematics

Nigerian Women in Mathematics

West African Women in Mathematics

African Women in Mathematics Association

As a member of these organizations for women in mathematics, I have opportunity of interacting with other women in Mathematics.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

I give endowment fund: Fadipe-Joseph Prize in Mathematics for the best female student in Junior Secondary School 3 in two high schools.

Also, I organize and coordinate Mathematics Club in a College. This is to encourage girls.

There should be funding opportunities for women and girls in mathematics. There should be age benefit for women with children when applying for any support.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I relate teaching with what the audience see daily. That is, from known to unknown.

How would you explain your research to a layman (non-specialist)?

Using mathematics to identify the strategies of solving physical problems.

Can you tell us about the applications of your research, if any?

I research in Complex Analysis (Geometric Function Theory) and Functional Analysis (Operator Algebra). The research areas have applications in dynamics.

Conclusion

What are your biggest achievements, and what your biggest failures?

Presently, I serve as a role model to many girls and women. This is what I lacked as I was growing up as a mathematician. At times I am incapacitated as a woman. I have successfully supervised eight female students out of

nineteen students at the postgraduate level. I have publications in reputable local, national and international journals.

Do you have a dream? Any particular problem you dream to solve now?

Yes, I have a dream of using Mathematics to solve physical problems. I want to have a research breakthrough by solving a problem that has not been solved. Also, I want the number of female mathematicians to increase.

Which advice would you give to young girls who want to engage a career in mathematics? Or If you had the option to give advice to a younger version of yourself, what would that be?

A young girl who wants to engage a career in mathematics should not allow any discouragement. Also, they should make a right choice of spouse because the choice of spouse in a career cannot be underrated.

Kenza Guenda

The challenging fact of mathematics fascinates me. Each time you discover or understand something, it is like you are the master of the world

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Education

- **2014 :** Habilitation
- **2011-2013** : Post-doctoral
- **2010** : PhD. Mathematics. USTHB
- **2006** : Master. AIMS. South Africa.
- **1995** : Magister. USTHB
- **1992** : BCS. USTHB.

Professional experience

- 1992-2004 : Lecturer. Faculty of Mathematics. USTHB
- 2010-2014 : Assistant Professor. Faculty of Mathematics. USTHB
- 2010: Associate Professor. Faculty of Mathematics. USTHB
- 2011-2013 : Post-doc at UVIC
- 2013- : Researcher at UVIC.

Honours and prizes

- 2011 Honours of the Chancellor of USTHB for PhD
- 2014 Honours of the jury for the HDR
- 2016 Elsevier Reviewer recognition.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? When have you decided to be a mathematician and why?

Because it is a challenging area and also it is at the heart of all the sciences; since I wanted when I was a child to be a scientist in every things, I said to myself you have to be mathematician.

How did you discover your passion for mathematics?

When I was 14 years old, Mathematics in the begin was like a foreign language for me, but suddenly I discovered that, there is always a way to understand it and then to produce and discover more and more.

When I was 14 years old, I got very good marks in all area, then I was qualified to follow any discipline in high school, but I decided to be a mathematician, because it is a challenging area, you can feel free when you are doing mathematics and you can apply it to solve problems life.

What fascinates you about Mathematics?

The challenging fact of mathematics. Each time you discover or understand something it is like you are the master of the world. It does not matter if you are poor or sick or hungry.

Did you have a role model that influenced your decision to become a mathematician?

I was fascinated by the people who devoted them self to science especially Marie Curie. When I was 8 years old I read her biography; she was a model for me. But I have chosen to be Mathematician after my father past away, he got a and after some weight night studying mathematics to enter a specialized school. I was 10 years old and I believed this was due to mathematics. Then I decided to defect the ghost of mathematics. At the age of 14, I was already in love with Mathematics.

Has anyone supported you in your choice and during your career?

My mother was always supporting my choice, although she was far away, she was a nurse, she had a large respect and admiration for science and specially mathematics.

Were there any specific factors that helped you succeed?

The most important factors are my motivations and the support of my teachers and family. Everything you want to do in life is difficult and easy at the same time; it depends from where you start.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

When I was doing my Master degree, I had to solve an equation; for that I had to first take gamma under some constraint. After working few nights on this equation, one night I was so tired that I slept on the table, and I have seen a nightmare on gamma which become like a ghost and wanted to eat me.

Career and Family

Do you come from an academic family? How does your family regard your career choice? Tell us about balancing family life with work life?

My Father was a policeman who died very young, when I was 10 years old, my mother was a nurse. My family respected my choice and more than that they encouraged me. They respected the fact that I wanted to be devoted to my research. As a Mathematician and specially as an academic it is very hard to have a balanced life, with many students waiting for you to help them to reach their dream in research and degree. But I think I managed to have some stability and balancing life.

Women and Mathematics

What were the biggest obstacles you had to overcome? What kind of prejudices, if any, did you have to face? How did that make you feel? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

The biggest obstacle is to change the mind of the people specially the colleagues and your Professors. To explain to people that applied mathematics is so important than pure mathematics, we can solve some pure mathematical problem using applied mathematics.

The most hurting prejudice it was when I was travelling alone for my study or for attending conferences. Some people cannot understand your passion for mathematics, which can erase the distance and any obstacle you overcome. Sure this situation was not comfortable for me, but I was saying to myself the time will change things and finally it was true.

I would like also to thanks Prof Selmane Schehrazad who was my mentor and she was always encouraging me.

Did you encounter any specific difficulties relating to the field of mathematics?

Of course each time you start a new area you have some difficulties in understanding, but the perseverance help you a lot to understand and fill the gap you have.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

It will be nice to have some Women mathematicians which can mentor young mathematicians. I knew bright women in mathematics, but for some reason they cannot find jobs (may be just because they were different), then they abandoned, because simply they need to survive.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I always focus on applied mathematics; in pedagogy we call that secondary motivation. The time process can change the secondary motivation to primary motivation, which is mathematics for mathematics.

How would you explain your research to a layman (non-specialist)?

Actually I am working on error-correcting codes and cryptography. It is on the border of discrete mathematics, computer science and applied mathematics. We are taking care and designing some models which can be used to improve computing.

Can you tell us about the applications of your research, if any?

Security of communications
Speed and improvement of communications
Reaper of error of communications.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement is to transmit my vocation and interest to my students and some of my Professors and colleagues. My biggest failures are to fail in transmitting the same vocations to some of my colleagues and professors.

Do you have a dream? Any particular problem you dream to solve now?

Yes I have a dream to apply mathematics in solving problems of misery in the world. One day one of the greatest Mathematicians wanted me to work with him on some theoretical problems in mathematics, (which may have some application that I cannot notice it), I said to him there are too much misery in the world and the life is too short to waist it on this kind of problems. It was true we are on this earth for a short time we have to leave a good legacy for the next generations of researchers.

Which advice would you give to young girls who want to engage a career in mathematics?

I liked the advice of Marie Curie; It is crazy to leave and abandon your dream for any one. You have to find a dream and follow it.

Josephine Wairimu KAGUNDA

My dad provided my fees when he hardly could, did fundraising when I got university admission to do mathematics. I owe my old man all my success

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Education

2012: Ph.D. Biomathematics. University of Lorraine, France.

Current position: Senior Lecturer. University of Nairobi

Work experience: Over Ten years teaching at University and more than 15 years as a midlevel college and as a high school teacher.

Questionnaire

Your story with mathematics

Can you tell us something about your story?

I am Kenyan, mother of 2 boys and one girl. I grew up in the village with little resources. I was determined to work hard and escape the biting poverty in our home. I had women, my mother's friends who walked with me in my teenage years, so I was never wasted. I worked hard and loved mathematics

all the way. When I was in class seven, my dad bought for me my first book ever called “Revision Mathematics”. I loved it so much; I did all the sums from cover to cover many times which made me do very well in my final exam. I live in Kenya and work at the university of Nairobi. I believe in girls’ education and empowerment to bridge the gender gap and I am doing my best to encourage as many girls as possible to pursue mathematics and sciences for their future careers.

Why did you join the field of Mathematics?

I found myself doing mathematics when I knew myself. I used to help the teacher in primary school solve the difficult problems on the black board when he was stuck. Now I do it as an income earner and as a hobby.

How did you discover your passion for mathematics?

I can’t really tell when exactly my passion started, but I was doing mathematics when I learnt how to read and write. I did in my primary school, in high school, in my advanced level, undergraduate, masters, PhD and I am still fascinated by the subject.

Has anyone supported you in your choice and during your career?

My dad has been very vocal about my success and love for books, so he went out of his way to protect me from preying men in the village, provided my fees when he hardly could, did fundraising when I got university admission to do mathematics and refused to give up on me, when fees were a challenge. I owe my old man all my success.

Were there any specific factors that helped you succeed?

- Determinations
- Funding from various sources

- Encouragement from my teachers
- Desire to make a better living for my family

Would you see it was easy for you to enter your field, and ultimately excel?

NO, it's one big fight for survival and I am still fighting.

What challenges did you encounter on the way?

- Lack of academic resources
- financial strains
- Family challenges in the course of my career; my marriage broke down in the middle of my first year in masters.

Career and Family

Do you come from an academic family?

No. I am number five and was the first one to join university.

How does your family regard your career choice?

They think it's the best for me and any other girl gifted in maths.

Is it hard to manage both career and private life? Tell us about balancing family life with work life?

Yes it is. There has been sacrifices from both ends at different times, I just make sure my family comes first, and my work second. Like if my kids need me in the evening and I have work to do, I serve them first and work when they sleep. So it's tiring. A lot of sacrifice on your sleep and energy. It's not easy many times it's just by the grace of God. I delegate a lot of house work and get professional assistance when need arises like a taxi driver to pick them up from school. My relatives also come in handy when I have to travel

out of town, to come and live with them in my house, and also attend school meeting in my absence.

Women and Mathematics

What were the biggest obstacles you had to overcome?

Balancing family and career, Finances have always been a challenge, so I took long to even think about starting my masters due to lack of fees, as even family basic needs were a challenge. This delays the benefits one would enjoy with an extra degree. Going to study for my doctorate, outside the country when I had to leave my kids with a nanny for three months, it's so depressing to say the least.

Did you ever have the impression that it would be easier/harder if you were male?

Yes it's easier for men. They carry no 49regnancy and I have to cook and clean up after everybody

What kind of prejudices, if any, did you have to face?

Men supervisors favour male students.

How did that make you feel? Were you able to overcome these?

It feels deflating after all the efforts and sacrifices you have made to come this far, but, since I have a goal, I just decide to hang on and look at the sweet end, when I finally complete my course

Did you encounter any specific difficulties relating to the field of mathematics?

FEES for African girls is a big problem

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

AWMA, KWIMSA, AWM.

Exposure, mentorship, collaboration, referees, and workshop to share my work and meet other great women who give me mathematical company

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools?

Yes, I am an ambassador for maths in my country, visiting schools and telling them maths is a tool they cannot afford to ignore. I have done a one year project with the French Embassy in 2013 to mentor mathematics clubs in High school. We developed models for HIV/ AIDS with my club in my old school. Our last proposal to DREAMS Challenge in 2016 was unsuccessful. We wanted to have holiday Mathematics camps for girls, where, for 3 days, we work with talented girls from disadvantaged schools, to improve their good grades and give them early mentors to usher them into science courses at university. So, Yes the programs are very much necessary and I will support them locally and out there.

What else, do you think, could further be done to support woman with mathematics as their career?

Scholarships and holiday camps and maths clinics. Newsletters where younger girls can refer like other professional careers.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I use class participation to introduce the concepts. Most non mathematicians are way below what one can imagine. I don't assume that they have the basic and required knowledge. Making them solve problems on the board

helps me to get to their level, know what problems are there and correct the mistakes as there may not be time to look at each and every students work. I try to keep it simple and use the known to unknown introduction of the hard concepts. They need a lot of personal interaction and worked examples, so I teach halfway and then go round attending to individuals to bring the concept nearer home. I also try to go slowly so that they have time to grasp the contents.

How would you explain your research to a layman (non-specialist)?

I develop models for infectious diseases. I work on malaria for example, using equations to describe population, disease transmission, with parameters representing the various rates if changes and use the equations to predict outcomes when population or rates change in the model. Instead of using human beings to experiment, we can use symbols and see what happens as the symbols vary. These changes include proposed intervention or infections

Can you tell us about the applications of your research, if any?

Mathematical modeling is used a lot in disease control and elimination, vaccination assessment and testing of proposed strategies instead of using human subjects for the tests. The research that we do can help to predict the emergence of an epidemic, suggest control measure and suggest critical intervention times, like when to stock health facilities with relevant medicines when an outbreak is about to happen, It can also help policy makers budgeting for health department as intervention strategies with the highest effect can be derived from the model.

Conclusion

What are your biggest achievements, and what your biggest failures?

Getting my three degrees, travelling out to present my work.

Do you have a dream?

To become a professor in the next five years.

Any particular problem you dream to solve now?

How to get a postdoc out there where I can do serious and world class research and produce quality publication and results. My dream for the young girls is to break the low level of transition from one level of education to another, especially for the women in maths. Usually, we have many girls who do well in final exams, but will end up in various fields instead of mathematics. Other cases are fewer women will come back for masters in mathematics even when they were the best at graduation. Many go to professional fields like accounting and project management, so it takes too long before we get a woman proceeding to the highest level in mathematics. The other issue with transition is family life. By the end of an undergraduate, most girls are hooked for marriage, which comes with childbirth and other commitments. So they delay coming back for masters, others have done their masters, but marry off and delay coming back for PhD, while their male counterparts, though getting married also, are able to continue with their studies. Mentorship, to help them balance family, work and studies is essential to avoid long delays which, sometimes, become a final stop for any further studies.

Which advice would you give to young girls who want to engage a career in mathematics?

Work hard, finish with academics first before getting into family life. Do the best you can and never assume that the world will have mercy on you because you are a woman! You have to fight with the men in a tilted field that always favour them. Mathematics needs consistency in follow-up of the concepts learnt, consistent revision and working out. Mathematics is easy and applicable in life. Not just in teaching but in many other careers. It is the doorway to the many science fields that girls can excel in like engineering, medicine, IT, etc. Mathematics in not for the lazy girls who want easy things in life, it is for those, who can spend many hours thinking and trying our solutions to problems, who are ready to spend hours on books looking at what they have to offer.

Jamila Karrakchou

First Moroccan woman to have a PhD in Mathematics

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Education

- **1984**: Ph.D. in Applied Mathematics, University of Montréal, Canada
- **1979** : Doctorate in Mathematics, Université de Bordeaux, France
- **1973**: Post graduate diploma (DEA) in Applied Mathematics, University of Bordeaux, France
- **1972**: B. Sc. In Mathematics, University Mohamed V, Rabat, Morocco.

Professional experience

- **Since 2015 :** Part time Professor, Université Internationale de Rabat, Morocco
- **2011 – 2015** : Part time Professor, Ecole Marocaine des Sciences de l'Ingénieur, Morocco
- **2010 – 2011** : Visiting Professor, American University of Sharjah, UAE
- **2006 – 2010** : Professor, Ecole d'Ingénieurs en Génie des Systèmes Industriels, Morocco

- **1989 – 2005** : Professor, Ecole Mohammedia d'Ingénieurs (EMI), University Mohamed V, Morocco
- **1985 – 1989** : Associate Professor, Ecole Mohammedia d'Ingénieurs, University Mohamed V, Morocco
- **1980 – 1984** : Adjunct Assistant Professor, University of Montreal, Canada
- **1975 – 1980** : Assistant Professor, University Mohamed V, Morocco

Academic Responsibilities

- **1994 – 2000**: Head of Mathematics section, Department of General and Technical Studies, EMI, Morocco
- **1993 – 1994** : Associate Dean, EMI, Morocco
- **1990 – 1992**: Head of Department of General and Technical Studies, EMI, Morocco
- **1986 – 1988**: Head of Mathematics section, Department of General and Technical Studies, EMI, Morocco.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics?

Since my young age, I have always liked mathematics and I also had a very logical mindset. I had superior grades in mathematics in high school, and it was therefore a natural choice to pursue higher education in mathematics and start a career as a mathematician. I was actually the first Moroccan women to have a PhD in mathematics.

What fascinates you about Mathematics?

The logic behind solving mathematical problems has always fascinated me.

Has anyone influenced your decision to become a mathematician and how?

Although I already knew I wanted to become a mathematician, my parents and high school teachers have also encouraged me to pursue my passion and register for higher education in mathematics.

Were there any specific factors that helped you succeed? What challenges did you encounter on the way?

My determination was definitely key to my success. It also helped greatly that my husband shared my passion for mathematics, as we pursued jointly this path.

It was rather challenging to prepare my PhD while raising two young children, especially as we were thousands of kilometers from our home country and our families.

What is the most memorable thing that has happened to you while working in mathematics?

I have been particularly touched when some of my graduate students from Ecole Mohammedia d'Ingenieurs honored me through a moving tribute, on the fringes of an international conference. That coincided with my 60th birthday, and it was a memorable event.

Career and Family

Do you come from an academic family?

My father has never pursued higher education, but he was a great intellectual, involved in a political party. As per my mother, although she's illiterate, her intelligence has always surprised everyone around her.

Is it hard to manage both career and private life? How do you manage both?

Besides the period when I was preparing my PhD in Canada, it wasn't particularly hard to manage both career and private life. In Morocco, it's very common to have domestic help at home; also my mother lived with us for several years, and that was a considerable help, allowing me to focus on my career while spending quality time with my family.

Do you have kids? Tell us about balancing family life with work life?

I have 3 daughters, they are now adults and all have successful careers in various fields, but not in mathematics. A real advantage of being a university professor was that I benefitted from numerous holidays, which coincided with the girls' school breaks, and that allowed us to spend quality time together, travel and enjoy various adventures.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? How did that make you feel? Were you able to overcome these?

The biggest difficulty I encountered was the lack of funding to participate in conferences or other such events. At the time, we didn't have internet and therefore limited access to all the information available today. As a result,, sometimes I had to make sacrifices at the expense of my family, such as using vacations funds to attend an important conference. This is not specific for women though, but for all researchers at that time.

That said, in my country and for my generation, unfortunately it was indeed harder for women than men to succeed, especially in a scientific career. It was a real challenge and I'm proud to say that I fought and succeeded.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Yes, it would be great to organize such programs. Mathematics is often associated with "nerdy" personalities and is not perceived as a very feminine field. Sensitizing young people, and in particular young girls, of the impact of mathematics on a vast array of fields could be greatly beneficial. Such fields include environment, health, economics and engineering, to only name a few.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

As mentioned above, it's important for students to understand how mathematics could be applied to various real life situations, and to different professional fields. My strategy to catch and keep the attention of my students is therefore to clearly demonstrate how some issues in fields like medicine, economics or others, could be solved through mathematics, by studying concrete examples.

Conclusion

What are your biggest achievements, and what are your biggest failures?

I am particularly proud to have been able to supervise students who are now excellent researchers in several Moroccan universities. I still have excellent relationships with most of them.

For family reasons, I have accepted an early retirement and have therefore left my former job as Professor at Ecole Mohammedia d'Ingenieurs, which meant that I also stopped all research activities. That remains to this date one of my biggest regrets, and the solution I found to keep mathematics in my life was to teach as part time Professor in other private engineering schools.

Do you have a dream? Any particular problem you dream to solve now?

In the past, I had started writing some mathematics manuals, and my dream would be to resume that work, finish those drafts and publish the manuals.

Which advice would you give to young girls who want to engage a career in mathematics?

I would like to tell to all girls engaging in a career in mathematics to persevere and never give up their passion, and establish themselves as a reference in mathematics alongside their male colleagues. It's important that they identify the various usages and applications of mathematics, for the day to day challenges.

Yirgalem Tsegaye Kifle

Mathematics is beautiful, original. It is something that keeps you thinking and thinking

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Education

1996: PhD in Mathematics (Combinatorics). Dipartimento di Sistemi e informatica, University of Florence, Italy

1989: MSc. In Mathematics. Addis Ababa University

1982: B.Sc. in Mathematics. Addis Ababa University

2015: Higher Diploma in Learning Teaching in Higher Education, Addis Ababa University.

Professional experience

- Teaching Mathematics at the position of Assistant Professor since 1997
- Associate dean for Continuing and Distance Education at the Faculty of Science, 2007- 2011
- African Virtual University (AVU) Director, 2004–2006
- President of the Ethiopian Mathematical Association

- Worked in Faculty Academic Commission, Graduate Academic Council, Student Affairs Committee, Staff affairs committee, etc.
- I had been teaching in high schools and then in an agricultural college from 1983-1986.

Questionnaire

Your story with mathematics

Can you tell us something about your story?

Let me say few words about my school days. I was one of the best and the youngest almost in every class at the elementary school. I was very good in every subject except in home economics, handcraft, physical education and art. In fact, I was allowed to complete four years of education in two years. I loved all the subjects, as I said it earlier, and had no special interest to any of the subjects. Then there came a revolution – a transition from the feudal monarchy of Haile Selassie to the Stalinist dictatorship of Mengistu Haile-Mariam, in 1974 for the next 17 years. I was a very enthusiastic and brilliant 13 year's old 9th grader, when the revolution took place. The unique source of happiness and enthusiasm I had then was just going to school every day and enjoying my classes. I still see and feel that the love and enthusiasm I had for my school was almost rapidly growing the way: $y = m\,t + b$ for some large m would, for a while, till the revolution.

Then, schools started to be very unreliable and dangerous places to frequent. The nightmarish revolution had lived long enough to deprive me of that simple but intense beautiful feeling I had for school, my teachers and classes. Everything was eventually crashed! Ya, I am living so complaining

about how my love for school was cashed; many brilliant young boys and girls lost their lives too.

Then everybody was looking for a shortcut to something- work or going abroad etc. I was tempted to join a kindergarten teacher's training college, but thanks to my uncle and father, I was not allowed to give up on further education that easily. Then there came a special opportunity for good students throughout the country to join a one year preparatory program, which enables them to join the university afterwards. In fact the scope of that school was to produce best teachers for the country. That was the best available option, specially for those who lived in Addis. One had to pass the entrance exam though- mathematics, English and Amharic. I was the only one out of 40 who passed from my school and joined the Beedemariam Preparatory school.

It sounded to me like a new way of life, in a different home (campus) rather than a continuation of my enthusiastic school life which was harshly interrupted. I don't remember dreaming or anything like that for a long time since. Well I liked it, living in campus was good- safer (many youngsters were being killed) and the independence – I was free of anybody's control (I was seventeen then).

Ya, I finished that program and it was time to pick a field. I had a very good result; we all had from that school, but there was a commitment we signed to serve as a teacher after graduation for some years. Many were very conscious of their choices; they didn't want to be a teacher, though at the time they had no option but join this school. Teachers were among those who earned low (still getting worse). That was why almost no one wanted to be a teacher. So, they just started to find ways of liberating themselves from the consequences of the commitment signed via various ways and declared their freedom to join non education fields like Engineering, Pharmacy, medicine, etc. I was wondering why they all hated teaching, but due to peer

influence I filled out the form saying that Engineering was my first and Mathematics, my second choice.

I never hated teaching; I still consider it the best profession ever. Knowing that I was going to be a teacher, there came the question “which subject”? For me, this one had a unique solution too! “Mathematics”! It was a subject in which I scored an “A” with a little preparation for the exam, and I have liked it too. I joined the field of mathematics and graduated after 4 years. The enthusiasm I lost in those days hadn’t returned even then. I was convinced that I had to study and finish University; I had never entertained other options at all. Never dreamed of money or anything like that, but education. I met the father of my kids when I was a final year student. Continued engaging myself in new experiences, assigned to teach math in a high school in some province (North), had my first son Ahadu, then transferred to another province (South) and got a girl (Semhal) and four years went by.

I continued my studies to get an MSc in Math. That was a hell of an experience- I had to take care of two little ones (one was 2 and the other one four), with a very scarce financial resource; their father left the country for further education, when I joined the university to do my MSc. I don’t think I would be able to express well my situation in words. So, I just leave it here.

After graduation, I was asked by the ministry of education to go back to the place I was teaching at to serve another four years for the training I was given. I just refused. I continued teaching in private schools till the time came when the father of my children persuaded us to join him there in Italy.

There I joined the University of Florence, Dipartimento di sistemi informatica for my PhD studies. I don’t want to continue lamenting on how difficult my situation was, while studying and taking care of a family, again, with a scarce financial resource and a third child.

Since I started working on my PhD, I began to gain more and more interest in the field. We returned home and I joined the Addis Ababa University, department of mathematics. Since my return, couldn't get enough time to focus on the things which interested me and continue to do research in the area I started while I was there, because I had to I keep on swimming in the sea of numerous courses to numerous students, trapping myself in earning enough to raise my kids.

This went on for many; I had to teach almost every day and everywhere to be able to earn until all my kids joined the university. Two years ago, my little one has joined the university and I am a free person for the first time, thinking to have more and more time in the" monastery" of mathematics, just to satisfy my curiosity and ever growing love for the field of combinatorics and graph theory.

What fascinates you about Mathematics?

The fact that I see it as a collection of beautiful poems of logical ideas.. it gives you great satisfactions when you see even the little things clearly...

Has anyone influenced your decision to become a mathematician and how?

Of course with the encouragement of my father, my uncle and my teachers, I had always felt that I was meant to be a scholar; mathematics was my choice, no model for that!

Has anyone supported you in your choice and during your career?

Nobody participated in my choice of the field. It was my own conviction. It didn't even take me some time to think. The father of my kids, my ex husband, wanted me to continue my education and even took us to Italy, probably couldn't think of how much support it takes to really help someone achieve a goal like this; he was not supportive in practice! It was tough.

Would you see it was easy for you to enter your field, and ultimately excel? What challenges did you encounter on the way?

It was easy for me to pick the field; nothing was like it. Still, I couldn't excel, because of my personal life- Mentioned earlier, and the challenges as a mom with no assistance from others.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

I believe the memorable experiences are yet to come. I am not sure if it is considered funniest for you, but sometimes, when I concentrate to work on some problem, I see the mathematical objects as characters of a drama, and end up writing stories on them instead of focusing on the problem itself. While writing, I just keep on smiling and entertaining myself.

Career and Family

Do you come from an academic family?

No, my father was a taxi driver who had read books of all kind 80% of each night. He really was brilliant. He was 100% convinced that I was meant to be a scholar; didn't matter what kind.

Tell us about balancing family life with work life?

I think and believe that kids are much more important than anything else. I have tried to incline more to their side than anything else; I don't regret that! You can see I couldn't get the right balance.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? What kind of prejudices, if any, did you have to face?

Let me tell you one thing clearly. I have never entertained the fact that I am a female as a reason to any capability or incapability. I was brought up to think I am a human being and could do anything if I tried enough. After having kids, I felt that they were my responsibility, and tried to solve problems the best way I could.

I am fully aware of the prejudices; still I have no ears or eyes to entertain them. If something didn't work, I believe that I failed to plan it effectively. If I am strong enough then I can completely ignore or neutralize such prejudices.

Did you encounter any specific difficulties relating to the field of mathematics?

Mathematics is beautiful, original. It is something that keeps you thinking and thinking.

The difficulties I met is that I have finished my beautiful years struggling to do routine things, even if I loved to get some free time to focus on this love. Now that I tried to make space for that, I have to learn lots of other things before I can do something new myself, not to mention that the mind gets slower and there are millions of young mathematicians out there with their fast processors dealing with it. No matter how hard you think about something, there will almost always be someone who has done or treated that subject. Mathematics is not some local plant that you plant, water and measure, to write a report and tell that. It is frustrating, but still I consider it the best lover I have got to live and spend my years with. Yes resources are scarce, but getting better with technology and networks today!

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Yes, I am a member of AWMA (African Women in Mathematics Association), vice-president for the region of East Africa. I am also a member of AMU-CAWM. Networking is very important where there are various problems, for example like scarcity of resources. Encouraging one another and working together can make us more productive and most of all, we can use our network to solve our common problems like prejudice and discrimination. Empower ourselves to do more and most of all encourage young girls to join the field of mathematics and be more productive.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I make the class interactive; try to find examples and analogies in their fields, if possible, or other simple things in the surrounding or in human relationships.

Conclusion

What are your biggest achievements, and what your biggest failures?

I taught more than 3000 students in those years since I started teaching in the university. I have contributed in this regard, though I don't consider it a biggest achievement.

I always regret the fact that I am way backward with the research component of my profession, which is supposed to weigh 25% of my whole professional activities. I haven't lost hope yet, will work hard in this area.

Do you have a dream? Any particular problem you dream to solve now?

Yes, my dream is to come up with a problem I can partially or completely solve in the area I am working at.

Which advice would you give to young girls who want to engage a career in mathematics?

Plug your ears from listening to or entertain anything that has to do with prejudice about women and mathematics. A good time management can take you a long distance. Do something to lay a base for your profession before you start a family, both for the good of your family and your profession.

SENELANI MUSEKWA

I eat Maths, I drink Maths, I dream Maths, I walk Maths and of course I sleep Maths

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Education

2005: PhD. Mathematical Epidemiology. University of Zimbabwe (UZ)

1997: MSc. Mathematical Modelling. UZ

1993: B.A. Special Honours in Mathematics. UZ

1982: Graduate Certificate in Education. UZ

1981: Bachelor of Arts General (Majoring in Mathematics). UZ.

Professional experience

2003 to Present : Mathematics Lecturer rising to Full Professor of Mathematics at National University of Science and Technology

2001 to 2002 : Mathematics Lecturer at University of Zimbabwe

1996 – 2000 : Staff Development Fellow at University of Zimbabwe

1989 – 1995 : Mathematics Lecturer at Hillside Teacher's Training College

1982 – 1988 : Mathematics Teacher at Townsend High School

1984-2002: Examiner and Chief Examiner Cambridge O-Level Mathematics. Examination in Zimbabwe.

Honors and Prizes

- Awarded African Mathematics Millennium Science Initiative (AMMSI) Research Fellowship 2006.
- Awarded visiting researcher fellowship by African Institute for Mathematical Sciences (AIMS) 1 June 2009 to 31 May 2010 at AIMS, University of Stellenbosch.
- Awarded first African visiting research fellowship at DIMACS: October 2009 to January 2010.
- Awarded Megafest Business for "Personality of the year (2012) for outstanding community work in Matebeleland through National University of Science and Technology School Enrichment Program (NUSTSEP) for STEM subjects.
- Awarded a Prize for Outstanding Research in Promoting and Maintaining Good Health with one of my research project on "Hospitalization and Community home-based care for people living with HIV/AIDS" by the Research Council of Zimbabwe in 2013.
- Awarded an Apple Ipad by the then Minister of ITC, for outstanding research for a female researcher 2013.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

My name is Senelani Musekwa (nee Hove) from Zimbabwe. I am a married woman who graduated with Mathematics degree up to PhD level. I taught Mathematics in secondary school, teacher's training college and University. From Primary School my best subject was Mathematics. I real enjoyed my

mathematics leading me in helping other students with their Mathematics and Science.

The most important key points to be emphasized in my teaching of Mathematics were explained using activities done at home.

I am now a Full Professor of Applied Mathematics at National University of Science and Technology.

I joined the field of Mathematics after realizing that nearly all of the activities I did at home and Primary School started off with some mathematical concepts in the home or in the environment.

From Primary School my best subjects were Science and Mathematics. I really enjoyed my mathematics, leading me to help other student. While I also liked to be a Medical Doctor, this ambition was made impossible by the fact that I did not do specific science subjects like Chemistry, Physics and Biology at Ordinary and Advanced Level. I did General Science. Therefore Mathematics became my favorite subject and I do not regret. The application of Mathematics in any field made me to work with students since some students have no knowledge of where mathematics is used in real life situation. The application of Mathematics to disease modeling led me to choose to do a degree majoring in the application of Mathematics (Mathematical Epidemiology in particular). I later did this in my MSc and PhD studies majoring with mathematical Epidemiology. After achieving my MSc and PhD qualifications I embarked on research in Mathematical Epidemiology. Most of my 43 research papers published in international renowned journals are in Mathematical Epidemiology. In conclusion I decided to be a mathematician to enable me to use it in disease modeling.

What fascinates you about Mathematics?

I am fascinated by the fact that Mathematics can be used to solve real life problems. I always tell my students that “I eat Maths, I drink Maths, I dream Maths, I walk Maths and of course I sleep Maths”

Did you have a role model that influenced your decision to become a mathematician?

My mother inspired me, because she also wanted to be a mathematician but could not proceed because she got married after doing Sub B. I see application of Mathematics everywhere.

Has anyone supported you in your choice and during your career?

A number of people and organizations helped me to achieve my desire to be more than a medical a doctor I wanted to be. I am very much indebted to many people and organizations. In particular I thank my husband for the support he gave me to achieve my dream of being a qualified Mathematician. While he just have a first degree in Biological science, he encouraged me to go back to University to achieve my heart’s desire, that is, to have a PhD in Mathematics and carry out research for different diseases. That is why my research area is in disease modeling using both Ordinary differential equations and Stochastic modeling.

Were there any specific factors that helped you succeed? What challenges did you encounter on the way?

Determination and support from one of my teachers, my employer and husband, made me to succeed. It was made easier by the support I got from my family and from my Science teacher at secondary school as well as other well wishers. The challenges I had of paying my school fees made me cry every time when I was sent away from school for not paying school fees.

However I was given a job during holidays to enable me to get money for my day to day needs and school fees as well. Eventually my Science teacher helped me after I agreed to baby sit his daughter every weekend and holiday time. Although he had left Zimbabwe during the war period, he paid my fees for Form 5 (L6) and Form 6 (U6) studies. He also sent me bus fare and pocket money. Fortunately, I passed and went to University of Rhodesia then where I was given World University Scholarship to finish my undergraduate studies graduating with my first degree.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

Most memorable thing which happened was the fact that I did my research on application of Mathematics in Medicine, that is, disease modeling. To me this was better than doing a degree in Medicine which was my dream career. I really enjoy teaching and researching in Mathematical Epidemiology.

Career and Family

Do you come from an academic family?

Not really to start with because my two brothers who did O-level went to look for jobs because of lack of funding to pursue their studies. My nephews and nieces then followed my footsteps in Arts subjects because I was then able to fund them. They are also academics lecturing at University level.

How does your family regard your career choice?

My family is happy with my career choice, in particular, the application of mathematics in disease modelling, which is closer to a Medical Doctor.

Is it hard to manage both career and private life?

It is not hard to manage both career and private life as long as one plans for each activity. The support I got from my husband and children made it easier for me.

Do you have kids? Tell us about balancing family life with work life?

Yes I do have children. One needs to be organised to balance family life and work life. My family is very supportive of whatever I do.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? Do you have anything else that you'd like to tell us about?

The biggest obstacle I overcame was funding for my education in secondary school. I never blamed my parents for choosing to fund the boys when my father was out of employment. However self determination made it easier for me to realise my dreams of graduating with a doctorate in Mathematics. My husband encouraged me to carry out research in disease modelling. This helped me to become a Full Professor in Mathematics. My worry is that very few girls and women like mathematics. I believe there is need to keep on encouraging the girl child to study Mathematics as well.

FOR THE GIRL CHILD TO STUDY MATHEMATICS IS ESSENTIAL.

Did you encounter any specific difficulties relating to the field of mathematics?

Encouraging the girl child to do STEM subjects, in particular, Mathematics, was/is not easy and also funding for the girl child to study Mathematics at a higher level was/is not easy. On my part, not really, since I was working and therefore I funded myself to carry out research in Mathematical Epidemiology and going for conferences. However, I had problems in

seeking funding for the girl child to go for conferences. I thank my University administrators for funding me and the girl children in some cases, in particular, to go for conferences and workshops and of course sabbatical leave to help me with my research.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

In my country, Zimbabwe, I helped in the formation of Zimbabwe Mathematics Association where I am the Chairperson of the Association. We also formed Zimbabwe Women in Mathematics Association.

African Women in Mathematics Association (AWMA), where I am the Secretary, has helped me to meet other women in Mathematics in and out of Africa and share ideas on how we can encourage other women and young girls to embark on a carrier that needs Mathematics and Science.

This also encouraged women to embark on courses which require Science, Technology, Engineering and Mathematics (STEM). In my country, Zimbabwe, a number of girls have now enrolled in STEM courses in our Universities as a result of the outreach which we made in encouraging women and girls to embark on courses in the STEM disciplines. This helped me to carry out research on how best to help the girl child in achieving their goals.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

It is very necessary to have these special programs like Girls in Mathematics. In addition we can have camps on the teaching and learning of mathematics. This will help to demystify the subject and also help teachers

to share different methods of teaching Mathematics. Highlighting the importance of Mathematics in STEM disciplines can help women to realize the importance of having a career in Mathematics or other STEM disciplines..

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

It is very necessary to have these special programs like Girls in Mathematics. In addition we can have camps on the teaching and learning of mathematics. This will help to demystify the subject and also help teachers to share different methods of teaching Mathematics. Highlighting the importance of Mathematics in STEM disciplines can help women to realize the importance of having a career in Mathematics or other STEM disciplines.

How would you explain your research to a layman (non-specialist)?

Starting with examples where mathematical concepts are used in different situations and at home, in particular, will help a layman to realize mathematical concepts which are surrounding him or her.

Embarking on research which reveals the uses of mathematical concepts in day to day activities in our lives makes people appreciate Mathematics.

Can you tell us about the applications of your research, if any?

I have done mathematical researches in the dynamics and interventions of different types of diseases. This helps people and policy makers in particular, to understand the dynamics of different types of diseases and how best to prevent them. In a addition it is important to include the cost-effectiveness of the interventions, that is the cost on interventions used to combat the disease and to measure the cost of the different interventions of the different diseases to help the government, that is, policy makers, to

appreciate the importance and needs of the particular interventions in the treatment and prevention of different types of diseases.

In two of the researches I did, I did both the dynamics of the disease and included the necessary interventions to eradicate the disease and cost of the necessary interventions. The two researches I carried out are:

1. Modelling hospitalization, home-based care and individual withdrawal for people living with HIV/AIDS in high prevalence settings: The case for Zimbabwe, published in **The Bulletin of Mathematical Biology**.
2. "Cost Effectiveness Analysis of Hospitalization and Home-Based Care Strategies for People Living with HIV/AIDS: The Case of Zimbabwe, **International Scholarly Research Notices.** For these two researches I was given a prize by the Zimbabwe Research Council after being judged as the best practical researches.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement in my career was carrying out research to solve practical problems leading to my being promoted to Senior Lecturer, Associate Professor and finally to Full Professor of Applied Mathematics as a result of practical research I carried out. This was also due to the fact that I published 43 papers in renowned journals, wrote four book chapters on disease modeling and wrote four Mathematics text books for O Level, that is, Form 1 to Form 4. Beside research and text book writing, I introduced a program called National University of Science and Technology School Enrichment Program (NUSTSEP) to help students, in particular the girl child, doing O-Level and A-Level STEM subjects. This program uses activity-based methods for teaching the different concepts to the students. This resulted in more students passing their O and A level STEM subjects. In

addition, I introduced this program for any student who need help with STEM subjects and English language and able to sponsor him/herself. This program is done at National University of Science and Technology (NUST) School Enrichment Centre (NUSTSEC) which was bought by the University for outreach Programs. A number of students enrolled at this centre are helped with their STEM subjects. The same teaching methods, that is, activity based methods, is used at this centre.

My biggest failure was to concentrate on students with potential to pass the STEM subjects instead of also introducing a program for the weak students and also to source funding for those poor students who cannot afford the required fees. However we are now working on it.

Do you have a dream? Any particular problem you dream to solve now?

My dream is to include more girls from rural areas into the programs where they don't have qualified teachers for STEM subjects. I also intend to have more workshops for STEM teachers in rural areas. Final I want to help undergraduate students to do research. I intend to introduce research to undergraduate students, girls in particular, before they go for attachment by having a workshop for all second year students for 2 to 3 weeks to introduce them to research before they go for attachment. This is work in progress and I hope and trust if funds become available this will in January 2019.

Which advice would you give to young girls who want to engage a career in mathematics?

My advice will be given to the girls during workshops for all young girls to introduce them to the importance of Mathematics in a number of careers they want. Through the NUSTSEP and NUSTSEC programs, I will introduce them to the importance of mathematics in the different carriers before they go to university.

Faguèye NDIAYE

My dream is that all girls embrace a mathematical, scientific or technological career

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Education

2014 : Ph. D in Mathematics and its Applications.University Cheikh Anta Diop of Dakar, Senegal.

Professional experience

- Titular assistant professor and researcher
- Assistant professor and researcher
- Generally Inspector of Education and Formation
- President of the National Mathematics Commission
- Inspector of middle and secondary Teaching
- Educational consultant in regional training center,
- Teaching in High Secondary School.

Honours and prizes

Godmother « Miss Maths -Miss Sciences », 2017 Edition.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

In elementary school, I was already passionate about mathematics precisely, in calculus and in problems resolving. I was at ease when I get exercises.

It is in secondary school when I decided to be mathematician. Because for me, I thought only sciences have value in terms of knowledge. So, I was projecting to work in these domains of sciences: agronomy, telecommunication, aviation.

What fascinates you about Mathematics?

What fascinate me in about Mathematics, is to can resolve a practical problem of the live with mathematical tools. Also, I feel that I am in the right way when I resolve correctly a mathematical problem.

Did you have a role model that influenced your decision to become a mathematician? Or has anyone influenced your decision to become a mathematician and how? Family (father, mother, brother, sister, ..), teachers, friends, Other: specify. Has anyone supported you in your choice and during your career?

Agronomists engineers who came to our house had given me desire to become like them and my father encouraged me in this direction. But later, at university, I wanted to become a telecommunication engineer. My father had supported me and he had a lot confidence in me.

Were there any specific factors that helped you succeed?

The support of my family helped me succeed.

What challenges did you encounter on the way?

The main obstacle I encounter were jealousy and unhealthy practices of some colleagues. They act by malice or jealousy, while everyone should be able to do his research quietly. They do that to prevent from moving forward. Attitude that I did not understand because for me, each person has his destiny.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

In 1998, I was assigned to another establishment of secondary school. When I entered a class of Terminal T1-T2, there were only boys. When they saw me, they said to me: "Mrs. we don't have English class; we have a mathematics class". I answered them: "Yes I know but, enter in class".

They began to say, "Is she our Mathematical teacher now? We don't want a woman teaches us mathematics. We have never seen a woman teach mathematics."

I pretend I did not hear them and started my class. That day, not only did they answer my questions, but they also asked me a lot of questions; they pretended not to understand but I knew it was to test. At the end of the class they do standing ovation for me because this is the first they see a woman teaching mathematics but they were very happy with my class.

Career and Family

Do you come from an academic family? How does your family regard your career choice? Is it hard to manage both career and private life? Do you have kids? Tell us about balancing family life with work life?

No, my father was technician superior agronomist and my mother a seamstress. My family regard my career choice with lot of happiness. But they pity sometimes for me, they say that I work tirelessly and I do not rest.

For me it's not hard to manage both career and private life, I'm organizing for that; I planning everything and I not privilege one activity on another if that is possible.

I have three kids.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? What kind of prejudices, if any, did you have to face? How did that make you feel? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

The main obstacle I encounter was jealousy and bad practices of some people. They think that woman must not do high studies.

I think that it would be easier if I was male because I will have enough times to do teach and research.

Some people think that I'm too ambitious and I should not have a better status.

The bottom line for me is to be on the right path, do conscientiously what I must do. My philosophy is that, in the life I must be generous, share knowledge acquired, help my neighbor so that he can succeed like me.

Did you encounter any specific difficulties relating to the field of mathematics?

I didn't specifically, but when I have difficulties for understanding I do many researches for it and so my problem is resolved.

In the host institution the difficulties are that some colleagues do bad practices to prevent you from moving forward. They acte by malice or jealousy while everyone should be able to do his research quietly.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I'm treasurer of AWMA and Generally Secretary of SWMA. The main objective of these two associations is promotion of girls and women in mathematics.

This encourage me to move forward, to interest more on research and I tell to me "yes I can".

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Yes I consider it. Give them support, scholarship and facilitate access to documents.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

Yes it can be real challenge. The strategy to catch and keep attention of my audience is first to start with simple examples that are accessible to them before generalizing. This helps to demystify mathematics and motivate them.

How would you explain your research to a layman (non-specialist)?

By giving him an example in his environment.

Can you tell us about the applications of your research, if any?

The localization of schools, hospitals. In medical imagery and industry with identify form of a crack in a domain or a defect of material, etc.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievements are to do extensive research in mathematics to better understand certain phenomena in life, and my biggest failures are to believe that all people have same projects for the success of the youngest.

Do you have a dream? Any particular problem you dream to solve now?

My dream is that all girls embrace a mathematical, scientific or technological career so all our countries are highly developed. A particular problem that I am dreaming solve now is that each person considers his neighbor as his own sister or brother, stop jealousy and quarrels. Like this, with all our hands united we could do wonders in the scientific field.

Which advice would you give to young girls who want to engage a career in mathematics?

Believe herself, be self confident and to perseverance in studies.

Selma Negzaoui

In the first day of teaching, when I wore my white apron, I said that this is exactly what I want to do

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Education

- **2013 :** PhD thesis in mathematics, Faculty of Sciences of Tunis, Tunis-Elmanar University.
- **2005 :** AGREGATION EXTERNE section : MATHEMATIQUES, IPEST
- **2005 :** E.N.S. of TUNIS diploma (Ecole Normale Supérieure), Tunis University.
- **2004 :** Maitrise de mathématiques. Faculty of Sciences of Tunis, Tunis-Elmanar University.
- **2002 :** DEUPC Diploma MPI. Faculty of Sciences of Monastir, Monastir University.

Professional experience

- **2015-2018:** Assistant professor in mathematics, I.P.E.I.M, Monastir University
- **2009-2014:** Assistant in mathematics, I.P.E.I.M, Monastir University
- **2008-2009:** Professor (Agrégée) in mathematics, I.P.E.I.M, Monastir University
- **2005-2008:** Professor(Agrégée) in mathematics, I.S.S.A.T Gabes, Gabes University.

Questionnaire

Your story with mathematics

When have you decided to be a mathematician and why?

It was at the age of 12 that I decided to be a mathematician and to spend my life learning and teaching mathematics. I was a brilliant student in all subjects. Our educational system promotes maths. I was esteemed by my surrounding: my parents, my teachers, my colleagues, when I succeeded in maths test. This gives me self satisfaction.

What fascinates you about Mathematics?

Overcome the difficulties and the joy I find after solving a mathematical problem.

Has anyone influenced your decision to become a mathematician and how?

The educational system influenced me to become a mathematician but I had the freedom to make my choice.

Has anyone supported you in your choice and during your career?

My parents, ENS of Tunis (Tunis university) until becoming a teacher in mathematics.

Would you see it was easy for you to enter your field, and ultimately excel? What challenges did you encounter on the way?

There is no difficulty to enter and excel in this field.

I have the challenge to continue research in mathematics and succeed to build a family and a social life.

It was difficult for me to convince my surrounding that I can do it.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

In the first day of teaching, when I wore my white apron, I said that this is exactly what I want to do.

Career and Family

Do you have kids? Tell us about balancing family life with work life?

I have two kids. It's hard to manage both career and private life but comprehension of the husband and the family makes it easier.

Women and Mathematics

What were the biggest obstacles you had to overcome?

Socially, the main task of a woman is to look after her family and to raise her children well. So, it's hard for a woman to move.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

Tunisian women mathematician association TWMA.
Meet women in the same situation it gives motivation to continue working
The association is a space to express itself and share its ideas

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

According to my experience there is no need to promote mathematics for girls in schools. The presence of women in math education attracts girls to practice this career.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I give examples that they could understand and ask them a question.

How would you explain your research to a layman (non-specialist)?

I can explain that what we do is to set the theoretical part that a researcher in another field could use

Can you tell us about the applications of your research, if any?

signals, radar, music diffraction phenomena...

Conclusion

What are your biggest achievements, and what your biggest failures?

Aggregation degree in mathematics was my biggest achievement in the teaching field but also it makes hard for me to get into math research.

Do you have a dream? Any particular problem you dream to solve now?

Working on myself, I could succeed to realize my dream.

Which advice would you give to young girls who want to engage a career in mathematics?

Be persevering, work hard and get rid of shyness.

Fatma Zohra Nouri

My dream is to create new jobs interacting with mathematics not just teaching and research

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Education

- 1979 : Baccalaureate Mathematics
- 1983: DES in Functional Analysis, University of Annaba
- 1985 : Master in Mathematical Modeling and Numerical Analysis, University of Oxford
- 1988 : Phd in Applied Mathematics, Oxford & Strathclyde University.

Professional experience

- Lecturer, Badji Mokhtar university, 1989-1994
- Senior Lecturer, Badji Mokhtar university, 1994-1999
- Professor, Badji Mokhtar university, 2000-Present
- Visiting Professor, King Saud University-SA, 2002-2004
- Short time visiting professor:
  IRISA-Rennes-France (1994, 2004), Paris 6, University-France (2006-2015), Imperial college-UK in 2009, Keele University-UK in 2012 and 2013, Strathclyde university-UK (2015,2017), Oxford University-UK (2011, 2016).

Honours and prizes

Algerian Grant for the National best students selection in mathematics,1983.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics?

I loved mathematics since I was a child. To me it has always been the subject that makes me think objectively in a logic manner.

What fascinates you about Mathematics?

Its interaction with other fields without contradictions.

Has anyone supported you in your choice and during your career?

My family was just proud of me being always succeful in my studies. However doing mathematics was not much for them (they would have liked me to be a medical doctor). Another aspect is that we were only three girls in the mathematics section in high school, and the only one girl for the PhD grant at that time.

Were there any specific factors that helped you succeed? What challenges did you encounter on the way?

Just my nature being a hard working and a determinant person. The challenge is that a woman can do anything and even better that a man.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

The most memorable is solving real problems: finding real solution for medical sciences, industry and engineering that contribute in predicting and solving socio-economic problems.

Career and Family

Do you have kids? Tell us about balancing family life with work life?

I have three kids and I manage well my private life, I cannot say it is easy but being well organised helps a lot!!

Women and Mathematics

What were the biggest obstacles you had to overcome? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

Taking positions was quite hard for a woman but not anymore now days!

Did you encounter any specific difficulties relating to the field of mathematics?

No good students in maths and no motivation for them. I keep trying to find good applications to interest them.

Tell us about the organizations for women mathematicians that you are a part of?

We are just starting with AWMA.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

Try to be very pedagogic and find a way to make things easier not complicated. Mathematics is the subject that is too symbolised and this can be confusing for non mathematicians.

How would you explain your research to a layman (non-specialist)?

You cannot escape mathematics in any subject whether by using calculus, statistics and now days the big step towards mathematical modelling and numerical resolution of any problem.

Can you tell us about the applications of your research, if any?

- Medical sciences: Models that helped in tumour evolution 2009 (Saint Anne's Hospital-UK, Cadiology), Keele University-UK 2012 (Orthopedy, Stem Cell)
- Industry: by image processing we helped to detect manufacturing defect 2013 (Arcelor-Metal, Algeria)
- pharmacology: we put up a model for a bispecific antibody 2016 (AstraZeneca-UK)
- Sciences of plant: a model to help in agriculture of Maise 2016 (Birmingham-UK).

Conclusion

What are your biggest achievements, and what your biggest failures?

A biggest achievement is working in plural-disciplinary groups. My oldest son as a pharmacist is doing lots of advanced mathematical modelling in pharmacology.

The only failure is not having good devoted students.

Do you have a dream? Any particular problem you dream to solve now?

My dream is to create new jobs interacting with mathematics not just teaching and research.

Since 2013, I am leading a master degree in Differential equations and Scientific computing, where our students take different subjects such as

image processing with mathematics tools and multiphase problems; I noticed that many are interested in our students.

Which advice would you give to young girls who want to engage a career in mathematics?

If you are devoted to mathematics go ahead there are lots of applications in real world.

Uchenna Petronilla Ogoke

Mathematics makes me to think outside the box

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Education

1999 : **BSc(Ed)** Mathematics. University of Nigeria Nsukka
2008 : **PGD** Statistics. University of Port Harcourt, Choba, Rivers State, Nigeria
2010: **M.Sc** Statistics. University of Port Harcourt, Choba, Rivers State, Nigeria
2015: **Ph.D** Biostatistics. University of Port Harcourt, Choba, Rivers State, Nigeria

Professional experience

I have lectured in the Department of Mathematics and Statistics for over seven years now, teachings Graduates and Undergraduates.

Honours and prizes

- State Honors Award, National Youths Service Corps Rivers State (**June, 2001**).
- International Travel Grant Award from the International Biometric Society for the27th International Conference held in Florence, Italy **July, 2014**.
- Award of the Best Young Statistician Poster Presentation at the 27th International Biometric Society Conference held in Florence, Italy **July, 2014**.

Questionnaire

Your story with mathematics

Can you tell us something about your story? How did you discover your passion for mathematics?

My story has not been too smooth even though I have passion for Mathematics since I was small. I discovered my passion right from home because my parents were teachers. I love to find out why my class mates then shy away from mathematics especially the female ones I decided to challenge the boys in the class.

What fascinates you about Mathematics?

Mathematics makes me to think outside the box.

Did you have a role model that influenced your decision to become a mathematician?

My father's keyword has always been that people who solve mathematics are smart and never had a dull moment. My Dad influenced me.

Has anyone supported you in your choice and during your career?

My Dad and my primary school teacher.

What challenges did you encounter on the way?

In the secondary and primary level, we lacked some of the major instructional materials.

What is the funniest or most memorable thing that has happened to you while working n mathematics?

In the university, some of the lecturers teach mathematics as literatures without practicing what they teach.

Career and Family

Tell us about balancing family life with work life?

The bother line is planning. Always have a program for yourself and obey it strictly. Moreover, my husband understands and loves academics.

Women and Mathematics

What were the biggest obstacles you had to overcome?

Very few girls in the class competing with so many boys.

What kind of prejudices, if any, did you have to face?

Some of your mates withdrawing from you saying maths is a masculine course and not feminine.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I feel fulfilled being part of the organization because this is going to widen my horizon because of the quality of women who has actually touched the world that you are going to associate with and also the upcoming ones. There is nothing like collaboration because there will be cross fertilization of ideas from all angles in the world of mathematics.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

This will be a great idea especially if it is taken to the grass root like the under developed countries where the girl child see mathematics as a mirage and thereby shying away from it.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I always start with set induction (telling short stories before the class)

How would you explain your research to a layman (non-specialist)?

Try to discover how it will help in the day to day activity. Eg teaching statistics is fun, people practice it day to day without knowing. My grandmother who did not go to school practiced it without knowing. Whenever any male child is born in the village, she will mark a big stroke on the wall while females are marked with short strokes. At the end of the year, she counts all the strokes to differentiate the males from the females. What a lovely mathematics.

Can you tell us about the applications of your research, if any?

In the university, Psychiatric hospitals. (Bipolar disorder patients)

Conclusion

What are your biggest achievements, and what your biggest failures?

Concluding my Phd in Statistics at the record time which is the highest degree.

Do you have a dream? Any particular problem you dream to solve now?

Becoming a well known and celebrated mathematician in the world. Catching the girl child in my country, young to embrace mathematics.

Which advice would you give to young girls who want to engage a career in mathematics?

Determination is the keyword. ALWAYS PERSIST EVEN WHEN THE GOING IS WRONG.

BOSEDE OGUNRINDE

DILIGENCE, HARDWORK AND COMMITMENT ARE THE KEYS TO SUCCESS

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Education

2010 : Ph.D. Mathematics. University Of Ado-Ekiti
2004 : M.Sc. Mathematics. University Of Ibadan
1999 : B.Sc. Mathematics. Ekiti State University.

Professional experience

Ekiti State University 2001 to date
2001 - 2004 : Graduate Assistant
2004 - 2007 : Assistant Lecturer
2007 - 2010 : Lecturer II
2010 - 2013 : Lecturer I
2013 - 2016 : Senior Lecturer
2016 - To date : Associate Professor.

Questionnaire

Your story with mathematics

Why did you join the field of Mathematics? How did you discover your passion for mathematics? When have you decided to be a mathematician and why?

I joined the field of mathematics because of my interest in mathematics. My passion for mathematics was discovered while in secondary school because I find it so interesting having my mathematics teachers around. I decided to be a mathematician at a very tender age.

What fascinates you about Mathematics?

Mathematics is a very simple subject that could be interesting if you give yourself to studying it.

Did you have a role model that influenced your decision to become a mathematician?

My mathematics teachers in secondary encouraged me and my university Professors.

Has anyone supported you in your choice and during your career?

Yes. I got support from national mathematical centre in Abuja Nigeria because they sponsored my first degree

Were there any specific factors that helped you succeed? What challenges did you encounter on the way?

Diligence, hard work and commitment. it has not been so easy but with full dedication in excelling. Mathematics needs time. So combining with home as a mother may not be too easy.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

The most memorable thing that ever happened to me was how I made 5 points out of 5 in some semester in my undergraduate days. That involved making grade "A" in all my courses for some semesters this actually encouraged my determination.

Career and Family

Do you come from an academic family? How does your family regard your career choice?

No, my parents are not even educated. They see it as a demanding career.

Is it hard to manage both career and private life?

Managing career with private live may be hard. I try to strike a balance so my private and home will not suffer.

Do you have kids? Tell us about balancing family life with work life?

Yes I have 3 kids but I try to let them realize the fact that mathematics is time demanding. I do most of my work in the night when most of them are asleep. I give maximum support to my kids so I do not deny them access to me when needed.

Women and Mathematics

What were the biggest obstacles you had to overcome?

The biggest obstacle I had overcome was obtaining Ph.D. because the research took me about five years.

Did you ever have the impression that it would be easier/harder if you were male?

It would have been easier if I were a male because there won't be distractions from children and this would have given me enough time but I am coping.

Did you encounter any specific difficulties relating to the field of mathematics?

Some problems may be difficult while solving, we actually do not have enough resources for research in my country Nigeria.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

Organization of women in science in developing world (OWSD)
National association of women in academics (NAWACS)
Association of Nigerian of women in mathematics (NWM)
African women in mathematics (AWM)

We meet to discuss mathematics and research. We also organise programmes that could help the younger ones like going to colleges to encourage the girls.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

Yes, it is a very good one.
Fellowship opportunities and grants for research

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

To keep the attention of the audience is to teach them mathematics with things around them that they can see this will catch their attention and make mathematics easier for them to understand.

How would you explain your research to a layman?

My research area is numerical analysis and this involves finding approximate solutions to problems. it goes beyond having solutions to problems in variable forms.

Can you tell us about the applications of your research, if any?

My research is applicable in so many field of study. i have developed some numerical methods capable of solving initial value problems of first and higher order which can solve problems in economics and the field of engineering, though most problems in engineering are of partial differential equation, i have also developed algorithms that could solve some of these problems.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement has to do with my being able to develop good schemes and methods that compares favorably with some existing methods and that also compares with the analytical solutions. on the other hand some stiff problems can be very difficult in solving.

Do you have a dream? any particular problem you dream to solve now?

I have a dream. I dream to develop a model/ method that will help my government out of the present unsecured situation.

Which advice would you give to young girls who want to engage a career in mathematics? or if you had the option to give advice to a younger version of yourself, what would that be?

The younger ones are to be dedicated and hardworking. The diligent shall increase definitely.

Marie Françoise OUEDRAOGO

President of the African Women in Mathematics Association and first woman in Burkina Faso holding a doctorate in mathematics

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Education

- 1994: « D.E.A. de Mathématiques » at University of Ouagadougou on Lie triple superalgebras
- 1999: « Doctorat de Troisième Cycle » at University of Ouagadougou on Cohomology of Lie triple superalgebras
- 2009: Ph.D thesis at University Blaise Pascal of Clermont-Ferrand, on Extension of the canonical trace and associated determinants.

Professional experience

- **1994-2001**: Stand-in teacher at Mathematics Department at University of Ouagadougou
- **2001-2013**: Assistant Professor at University of Ouagadougou
- Current: Maître de conferences at University Ouaga I Prof. Joseph Ki-Zerbo.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics?

I am a woman mathematician at the department of Mathematics at university Ouaga I Prof. Joseph Ki-Zerbo. I joined the field of mathematics because since high school I was good in mathematics and also in many other subjects. But I have preference in logic and computations rather than literature or social sciences.

So since that time and after high school diploma (Baccalauréat) I decided to follow studies in mathematics and after a career in the fields of mathematics.

What fascinates you about Mathematics?

I was fascinated by the fact that I could do mathematics by just understanding well the subject. Also I like logic, the fact to combine some hypothesis or concepts to get other results and so to solve a problem. I like also the possibility of generalizations of some concepts into various and unexpected ways.

Did you have a role model that influenced your decision to become a mathematician?

I didn't have any role model to follow but I was influenced by my teachers of mathematics at high school.

Has anyone supported you in your choice and during your career?

As I said above, I was encouraged by my teachers of mathematics. Also I was supported by my friends during my studies. In my career, I am encouraged by some colleagues, friends and family.

Would you see it was easy for you to enter your field, and ultimately excel? What challenges did you encounter on the way?

Since I chose mathematics at high school, I followed this way in my career. It was not so easy to enter this field. Even if your family and friends are very proud of you when you succeed in mathematics at high school, in the meantime some of your schoolmates make you some miseries because according to them, you do not have the right to be among them and they let you know. Also considering the same prejudices that suggest that women are not as good as men in math or that some men do not want to see women at the same level as them, I always feel like I have to work hard twice than men for the same result.

Career and Family

Do you come from an academic family? How does your family regard your career choice?

I don't come from academic family and at the beginning my family didn't understand my choice of career and tried to push me to change it.

Tell us about balancing family life with work life?

As a woman, it is very hard to manage private life and career in mathematics, mainly because so far in the society women are supposed to attend to their families in terms of food and caring for children. This leaves them with little time to attend to their research. It is then necessary somehow to find a balance to manage both private and work life.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male? What kind of

prejudices, if any, did you have to face? How did that make you feel? Were you able to overcome these? Do you have anything else that you'd like to tell us about?

Since I chose mathematics at high school, I followed this way in my career. But being a woman in this field is not so easy and you have to face big challenges to face such as:

- cultural and traditional bias,
- the intolerance of some peers who do not accept that a girl can compete in "their fields" of competence,
- the lack of role model of African women mathematicians in which you can refer to encourage yourself.

Of course, sometimes I thought that it would be easy for me if I was a male since men do not have to face all the obstacles mentioned above. Nevertheless being a woman gave me certain strength of character that allowed me to overcome these obstacles and continue today a career in mathematics.

Did you encounter any specific difficulties relating to the field of mathematics?

The main difficulty in the field of mathematics in my country, Burkina Faso, is the lack of grant or fund for research visits and participation in conferences. Also, the lack of libraries for research. However this last point is attenuated by collaborations with colleagues in other countries which can give you access to diverse libraries and other types of bibliographic resources.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I am currently president of the African Women in Mathematics Association (AWMA). AWMA was established in 2013 to contribute to the development

of mathematics and women in mathematics in Africa. Starting from workshops for African women mathematicians, we organized within the commission "women and maths" of the African Mathematical Union (AMU), we saw the need to create an association to better collaborate with similar associations like EWM in Europe and AWM in USA.

Thus we participate in the committee for Women in Mathematics (CWM) of the International Mathematical Union (IMU). AWMA has a website to interact with African women mathematicians and share information.

Thanks to AWMA, I met other women mathematicians, whether in Africa, in Europe or elsewhere in the world but also mathematicians. This allowed me to establish external contacts, exchanges and scientific collaborations with some of them. I also participated in international scientific meetings such as the International Congress of Mathematicians (ICM), the Pan-African Congress of Mathematicians (COPAM) and also in search of mathematics schools.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

It is necessary to organise such a program and also any other program aiming to promote mathematics among young girls at school. This can be done for example by working to publicise role models to stimulate vocations among young girls and help them in their choice of studies and careers in mathematics.

Also, national or regional associations of women in mathematics like AWMA are needed to help women meet other women in Mathematics and share ideas and collaborations in order to encourage African women to take up their studies in mathematics and to promote mathematics among women.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

My strategy is to find illustrative examples in their field of study or at least close to their field and also in everyday life.

How would you explain your research to a layman (non-specialist)?

At the beginning of my career, my research concerned algebra, specially superAlgebra versions of the concepts of representations and weak representations of Malcev algebras and Lie triple systems. Also generalization of results known on Malcev algebra to Lie superalgebra. I then moved on pseudoDifferential operators which are generalisation of differential operators that generalize the operator of differentiation. The introduction of pseudo differential operators offers a fundamental tool in the theory of partial differential equations in terms of operator theory and functional analysis.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement is twofold:

- being the first woman in Burkina Faso holding a doctorate in mathematics and also defending two theses in two different areas of mathematics, the first one in algebra and the second one in the theory of pseudodifferential operators.
- Contributing to the creation of an association of women mathematicians (AWMA) which had as corollary the creation of several national associations for the promotion of the African woman mathematician.

My regret is that so far there are not many girls embarking on studies in mathematics but I hope that our association AWMA can help to improve this situation.

Do you have a dream? Any particular problem you dream to solve now?

My dream of course would be that more women in my country and in Africa are getting into a career in mathematics. I am aware that it will not happen immediately but by encouraging women and girls to take up and continue their studies in mathematics, giving them role models to follow as this project of portraits of African women mathematicians aims to do.

Which advice would you give to young girls who want to engage a career in mathematics?

Being a mathematician is a good career. If you enjoy doing mathematics, go on and just do it. Looking back, we realize that we could have acted differently in some situations and we could make best decisions in some others situations, so If I had the option to give advice to a younger version of myself, I would draw her attention on it.

Milaine Sergine Seuneu Tchamga

I find it very fulfilling to see my students happy because I helped them understand Mathematics

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Education

- 2014 - 2018 PhD in Applied Mathematics at University of KwaZulu-Natal, South Africa.
- 2011 - 2013 Masters in Bioinformatics at University of Cape Town, South Africa.
- 2010 - 2011 Post Graduate Diploma in Applied Mathematics at African Institute for Mathematical Sciences (AIMS), South Africa.

Professional experience

- I worked as a teaching assistant in the Department of Mathematics and Applied Mathematics at the University of Cape Town in 2013.
- I served as a teaching assistant in the school Mathematics, Statistics and Computer Science at the university of KwaZulu Natal from 2014 to 2017.
- Currently, I am one of the IMU ambassador in South Africa and serving as the Communication Officer of the African Women in Mathematics Association (AWMA) since 2013.

Honours and prizes

First prize for the Best Final Presentation at the South African Young Scientists Summer Program (SA-YSSP) and I was placed second for my final report.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? When have you decided to be a mathematician and why?

I joined the field of Mathematics because I like it. I discovered my passion for mathematics in grade one. One day, I was chatting with my friends and they asked me which field will I chose? I thought for a while and then I said I will be a Mathematician.

What fascinates you about Mathematics?

The Logic of Mathematics fascinates me.

Did you have a role model that influenced your decision to become a mathematician?

Yes. My father. My father was a lectured mathematics in secondary school. He trained me and my other siblings in mathematics when we were still in primary school. Now Mathematics is a part of me.

Has anyone supported you in your choice and during your career?

Yes. By the grace of God, my family and particularly those who are mathematicians have really supported me a lot with their experiences, advices and even financial support when necessary. Also, I had very good lecturers and supervisors of mathematics who believed in me, trained me well and encouraged me as well.

Were there any specific factors that helped you succeed?

Yes. God and Funding. I would like to take the opportunity to thank God for His grace, knowledge and protection He has given me. Also, I would like to thank AIMS, DAAD and UCT for sponsoring my post graduate studies.

Would you see it was easy for you to enter your field, and ultimately excel?

Yes. It was easy for me to enter my field because already I had role models. I saw my father, my sister and my brother managing it.

What challenges did you encounter on the way?

The main challenge I encountered was that Mathematics demands hard work.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

The happy part of mathematics is when you finally proof/solve the problem you were searching for. Also as a teacher, I find it very fulfilling to see my students happy because I helped them understand mathematics.

Career and Family

Do you come from an academic family? How does your family regard your career choice?

Yes. My family is very happy with my choice and very supportive as well.

Tell us about balancing family life with work life?

It is a matter of priority. In order to manage both career and private life, it is important be organized and allocate a time for everything and to be disciplined.

Women and Mathematics

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I am part of the AWMA and IMU. They help me to get connected with other women mathematicians. Also, it is during the CIMPA School and the workshop organised by AMUCWMA at AIMS in 2013 that I got in contact with my PhD supervisor.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools?

Girl's day is very important. The earlier we get to like mathematics the more likely it is to engage a career in Mathematics. Personally I got in contact with mathematics in primary school through my father.

What else, do you think, could further be done to support woman with mathematics as their career?

Having mentoring (one to one) sessions to encourage, help and coach women with their difficulties they are encountering in mathematics. This could also help to know what women are going through and contribute by informing policy makers to help them out.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I usually use a simple language they are familiar with. Also, I take a lot of simple examples to make them understand.

How would you explain your research to a layman (non-specialist)?

My research consists in analyzing complex mathematical problems that describe phenomenons with two time scales (slow and fast) which are very difficult to analyse using existing methods. The main aim of the study is to find conditions under which such mathematical problems can be simplified without compromising the most salient features of their dynamics. I focused on the case where the expected changes of the dynamics of the original problem occurs with unexpected delays.

Can you tell us about the applications of your research, if any?

This research finds its application in many fields including population modeling, neurophysiology, biochemistry. It can be used in analyzing, for example, multiple scale ecological systems as it allows for recognizing situation in which the size of some species can drop below, or grow above, levels predicted by standard approximations.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievements so far were to be able to publish a paper in mathematics and also to contribute in teaching and encouraging young women (of first and second years) in mathematics.

Do you have a dream? Any particular problem you dream to solve now?

My dream is to be able to inspire as many women as possible to engage a career in mathematics and to be able to contribute in solving real life problems that have rob the world of its skillful man power.

Which advice would you give to young girls who want to engage a career in mathematics?

I would like to advise every young girl who want to engage a career in mathematics to remain focus on her goal and not to get discourage if ever things get harder than she expected. She has what it takes. It will be also good that she gives her best of every opportunity she considers good for her vision.

Rebecca Walo Omana

The first female mathematics professor in the R.D.Congo

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Education

- 1990 : PhD. Nonlinear Analysis. Université catholique de Louvain, Belgique
- 1985 : DEA. Nonlinear Analysis. Université catholique de Louvain, Belgique
- 1982 : MSc. Mathematics. Université Laval, Québec, Canada
- 1979 : BSc. Mathematics. Université du Québec à Montréal, Canada.

Professional experience

- 1982-1984 : Assistante (junior lecturer), Université de Kinshasa
- 1991-1995 : Associate professor
- 1996-2000 : Professor
- 2001- : Ordinary Professor
- 1994-2000 : Vice-Doyen Faculté des Sciences
- 2009- : Directrice de l'Ecole Doctorale en Mathématiques
- 2011- : Recteur de l'Université Notre-Dame de Tshumbe.

Questionnaire

Your story with mathematics

How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

I liked mathematics. I discovered my passion for mathematics since my childhood

What fascinates you about Mathematics?

The reasoning since my young age. At the High School, I was seduced by Analysis, and trigonometry I was fan of argumentations and proofs. This leads my choice of analysis at the university.

Has anyone influenced your decision to become a mathematician ?

My decision was influenced by my teachers and my father.

Has anyone supported you in your choice and during your career?

No, once my choice was done, I was able to go on myself.

Were there any specific factors that helped you succeed and What challenges did you encounter on the way?

My work. I worked hard.

Challenges of all kinds:

During my undergraduate and graduate training in Canada I faced many challenges. I was the only African woman in my class and in my Department. I had to double effort to be better and remove negative prejudices in the heads of my colleagues and my professors to be accepted. But in view of results, I was not only accepted but invited by groups of colleagues for research works. After my Master and Doctorate, I had to overcome the reluctance and masochism of male colleagues. Some act out of ignorance or jealousy.

What is the funniest or most memorable thing that has happened to you while working in mathematics?

The most memorable thing that happens in my career was the dissertation defense of two of my students the same day.

The most ugly and ridiculous thing was lately the accusation by a male colleague who publish in a newspaper of the City that I have power of spell that's way I manage and succeed what I do.

Career and Family

Do you come from an academic family? How does your family regard your career choice? Is it hard to manage both career and private life?

My parents are not academics but some of my brothers and sisters have their Masters diploma. My family is proud of me. There is no conflict, I can manage both together.

Women and Mathematics

What were the biggest obstacles you had to overcome?

To become Professor of Mathematics and the first woman in my country.

Did you ever have the impression that it would be easier/harder if you were male?

Yes, because of male prejudices.

What kind of prejudices did you have to face?

Jealousy, I just gave a story that passed to a newspaper of Kinshasa. To see a woman occupy important positions such as Dean, Director of Doctoral School or

Vice-Chancellor disturbs men.

How did that make you feel? Were you able to overcome these?

I was shocked but not for long. I am at ease and do my job even better.

Do you have anything else that you'd like to tell us about?

Mathematics is fantastic; as its name is female, it is a domain that should belong to us women.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I belong to AWMA, the AFMC (association of Congolese women mathematicians), the AFPC (association of Congolese women professor of university), AAMU, SAMSA etc.... All these associations have come into my life after being well established in my career, but they help me to leave a good legacy to young people.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools? What else, do you think, could further be done to support woman with mathematics as their career?

I think it's important to awaken the curiosity of kids. It would also be important for governors to offer scholarship or support for the academic fees of girls enrolled in mathematics classes at the University.

Teaching mathematics, especially to non-mathematicians, can be a challenge. What is your strategy to catch and keep the attention of your audience?

I try to make mathematics alive by taking examples in everyday life. For example, I know that each of them once went to the market, haggled and compared prices and quantities. I explain to them from this fact, the

derivation of their variable quantity according to the price, and then I generalize on an abstract case.

How would you explain your research to a layman (non-specialist)?

A little complicated, but I try to find examples in practical life to introduce my subject.

Can you tell us about the applications of your research, if any?

By modeling with differential equations (ODE and PDE), I made several applications in epidemiology. Recently, I have just written a multidisciplinary application of a metapopulation model in social psychology and Law. A publisher who read the paper invited me to write a book.

Conclusion

What are your biggest achievements, and what your biggest failures?

My biggest achievement is that I am happy to be a professor of mathematics. I have a lot of students. My biggest failure is that there are not many women professors, in DRC. I already prepared three, but they went away (USA, Brazil) with their husbands to work. I don't have another women professor but I am not discouraged, I am preparing two others in PhD.

Do you have a dream? Any particular problem you dream to solve now?

My Dream is that: mathematics become a normal women career in Africa

Which advice would you give to young girls who want to engage a career in Mathematics?

Mathematics can open any doors for a beautiful career. Do and love mathematics.

Zagharide Zine El Abidine

The logic and the reasoning fascinate me about Mathematics

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Education

1998 : Bachelor of Mathematics. Faculty of Sciences of Monastir, Tunisia.

2005 : Lecturer Certificate in Mathematics. Preparatory Institute for Scientific and Technical Studies, Tunisia.

2012 : PhD Mathematic Faculty of Sciences of Tunis, Tunisia.

2017 : Habilitation in Mathematics. Faculty of Sciences of Tunis, Tunisia.

Professional experience

- **1998-2005:** Professor of Secondary School in Mathematics in Tunisia.
- **2005-2012:** Lecturer in Mathematics. Preparatory Institute for Scientific and Technical Studies, Tunisia.
- **2012 to date :** Assistant Professor of Higher Education in Mathematics in Tunisia.

Questionnaire

Your story with mathematics

Can you tell us something about your story? Why did you join the field of Mathematics? How did you discover your passion for mathematics? Or When have you decided to be a mathematician and why?

I joined the field of Mathematics because I love Mathematics.

I have decided to be a mathematician when I was a student in secondary school at the age of fifteen. In this age, I already dream to become a Mathematician at university. After obtaining in 1998 my bachelor in mathematics, I teach in secondary school for five years. Then, I become lecturer in mathematics and I teach in Preparatory Institute for Engineers for seven years. In 2009, I return to postgraduate studies by registering in thesis.

What fascinates you about Mathematics?

The logic and the reasoning fascinate me about Mathematics.

Did you have a role model that influenced your decision to become a mathematician?

My teachers of Mathematics in secondary school had a role model that influenced

my decision to become a mathematician. They had transmitted to me the passion for Mathematics.

Has anyone supported you in your choice and during your career?

There are many people that supported me in my choice and during my career: my parents, my husband, my friends, my PhD supervisor.

Were there any specific factors that helped you succeed?

The encouragement of my entourage and the patience of my husband helped me succeed. I have a very supportive husband. Despite, I have better qualifications than him, he keeps going his encouragements to me. This is not usually accepted where we come from.

Would you see it was easy for you to enter your field, and ultimately excel?

It wasn't easy to excel but it has needed so much sacrifices.

What challenges did you encounter on the way?

The challenges that I encountered on the way were to reconciliate between my work and my family (my husband and my children).

Career and Family

Do you come from an academic family?

I don't come from academic family but my family encourages me to go on in my studies.

How does your family regard your career choice?

My family respects my career choice while they think that it is a hard choice.

Is it hard to manage both career and private life? Do you have kids? Tell us about balancing family life with work life?

I try to divide my time between my work and my private life. I have two kids: a daughter who's fifteen and a son who's twelve. It is so difficult to balance family life with work life.

Women and Mathematics

What were the biggest obstacles you had to overcome? Did you ever have the impression that it would be easier/harder if you were male?

I have sometimes the impression that it would be easier if I was a male because a male has less responsibilities than a female and he has more time to spend in working.

Did you encounter any specific difficulties relating to the field of mathematics?

I think that the difficulties concern the education system in our country. I think that the programs must be revised as well as the system of evaluation. But, I think that these difficulties are related to the education of all disciplines and are not specific to mathematics.

Tell us about the organizations for women mathematicians that you are a part of? How has this helped your career?

I'm not a part of any organization for women mathematicians. The only organization for women mathematicians (Tunisian Women Mathematicians Association) was founded in June 2015. I came into academics in 2009, when we haven't specific associations for mathematician women.

Do you consider it necessary to organize special programs like Girl's Day promoting mathematics for girls in schools?

I don't think that is necessary in my country where we haven't discrimination in studies because of gender. Tunisia has 300 women who has PhD in mathematics. Besides about fifty per cent of academic publications in the field of research in mathematics are by women.

What is your strategy to catch and keep the attention of your audience?

The strategy consists of giving examples and models of applications from other disciplines and real life.

How would you explain your research to a layman (non-specialist)?

I am interested in resolving differential equations and problems that may have applications in applied fields.

Can you tell us about the applications of your research, if any?

The problems that I consider have origins in physics, mechanics, biology...

Conclusion

What are your biggest achievements ?

My biggest achievement is my success to carry out my career alongside my family life.

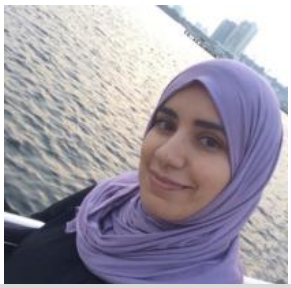
Do you have a dream? Any particular problem you dream to solve now?

I have an exam to pass and I hope to succeed. My dream is to continue to work and produce in the field of mathematics. I also dream to be able to transmit my passion for mathematics to my students.

Which advice would you give to young girls who want to engage a career in mathematics?

I advice them to have a lot of patient because it is very long way.

Safia Manar Elislam Benoumhani



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I was amazed by the wonderful and inspiring portraits in this booklet

After finishing high school, I had to go back to my home country Algeria in order to start university and since I had a foreigner diploma, I had few options in which I can choose. Among those options, I chose Mathematics. It wasn't planned and I have never thought that I will be an academic but I think I was somehow influenced by my father, who holds a PhD in Mathematics. I could say that I was quite good in Mathematics throughout my school years. I was also lucky to have great Maths teacher from different nationalities and that may be another reason why I pursued a degree in mathematics.

I was amazed by the wonderful and inspiring portraits in this booklet. I realized that most if not all of them were influenced by their early years mathematics teachers. That shows the importance of having and being good mathematics teachers. As female mathematicians, our main purpose is to be a good role model for young girls, change the youth's vision for mathematics and to take care of gifted and brilliant students in mathematics. I was really impressed by each portrait and I had to pick the one which has touched me the most, it would be Mrs. Nouri Fatma Zohra portrait. I can't wait to read next year's booklet and I really hope that it would be full of inspiring portraits from all over the continent.

AFRICAN MATHEMATICIANS WOMEN

A PORTRAIT GALLERY

July 2018

Published by

African Women in Mathematics Association (AWMA)

http://africanwomeninmath.org/

and supported by the

Committee for Women in Mathematics of International Mathematical Union

https://www.mathunion.org/cwm