



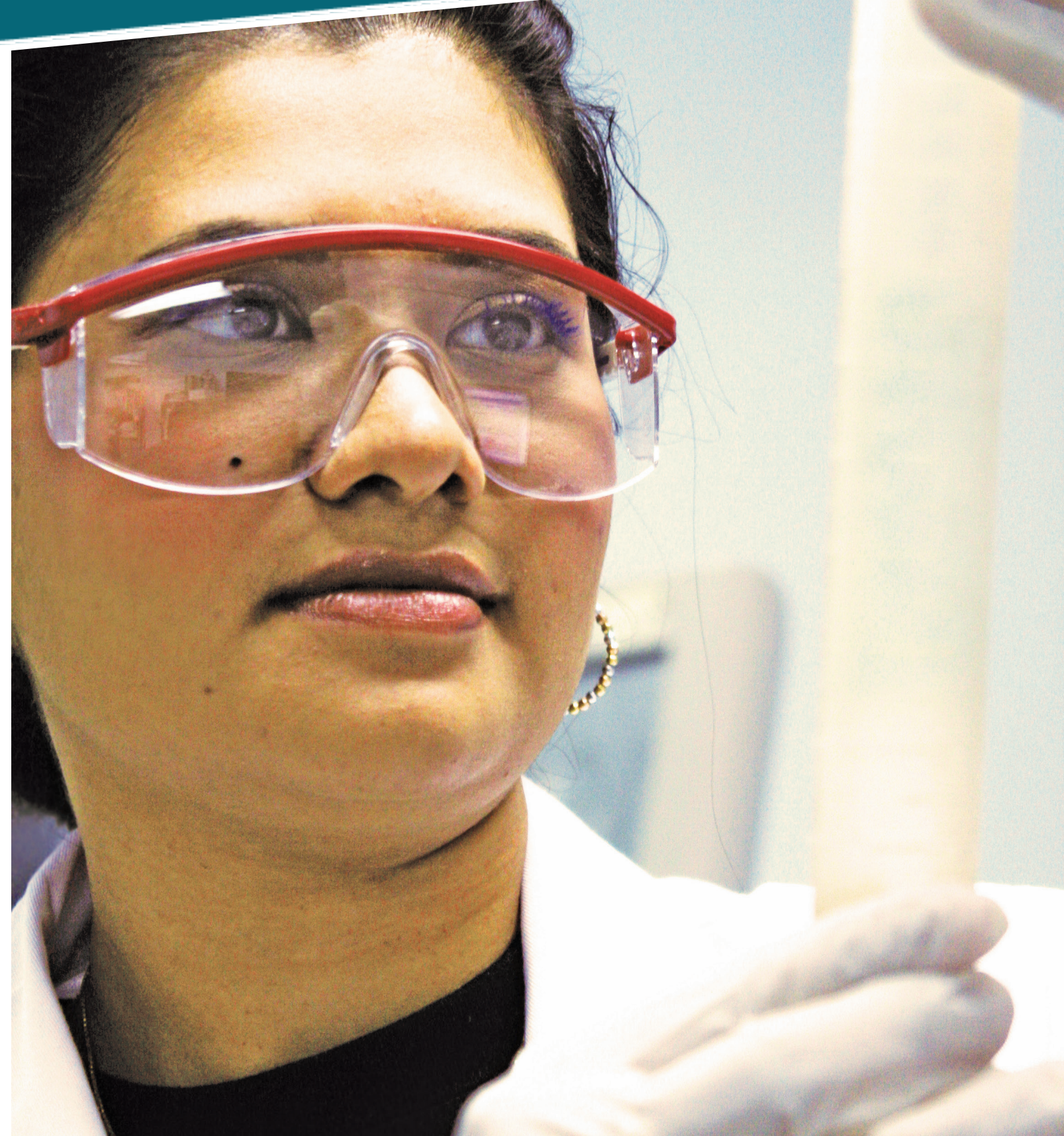
NIHERST
NATIONAL INSTITUTE
OF HIGHER EDUCATION
RESEARCH SCIENCE AND TECHNOLOGY
INCORPORATED BY ACT OF PARLIAMENT ACT NO. 26 OF 1984



Supported by the Ministry of Science, Technology and Tertiary Education

caribbean women In Science and their Careers™

April 2010
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In Science and their Careers™



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National Institute of Higher Education, Research, Science and Technology (NIHERST)

2011

ISBN



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Publishers:

Editors:
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Cover photograph by Justin B. Joseph. Some of the photographs and material used in this publication were obtained from the internet, other published documents, featured scientists and their institutions. This publication is NOT FOR SALE

Funding: MSTTE

ACKNOWLEDEMENTS

NIHERST wishes to thank all persons and institutions that contributed to the continuation of this important publication.

We are grateful to the featured individuals, their families, secretaries, professional peers and friends, as well as all who assisted us directly and indirectly by providing documents, photographs and other reference materials.

This book would not have been possible without the contribution of the dedicated employees of various academic, professional and government bodies. We also acknowledge the assistance of Julie Larsen Maher photographer at Bronx Zoo, Angela Pidduck, Mrs Dawn Marie DeFour-Gill, Johann Bennett, Virginia Balance, Roland Bynoe, Judith Fagan Brown, Beverly Taylor, Audrey Nicholls, Henry Lightbourne, Dr Victor Eastmond, Rita Warpeha, and Dr Erica Gordon-Veitch and all the others who selflessly gave of their time to help publicise the achievements of the icons featured in this volume.

NIHERST also thanks the team responsible for bringing this project to completion, namely, Keironne Banfield-Nathaniel, Sasha James, Stacey-Ann Sarjusingh and Alana Xavier, and other members of the International Projects Unit who conducted interviews, researched and authored the profiles; editors Christiane Francois, Joycelyn Lee Young and Trinity Belgrave.

Finally, NIHERST expresses its gratitude to the Ministry of Science, Technology and Tertiary Education for once again endorsing the publication of this valuable educational resource.

INTRODUCTION

The Caribbean region has made significant strides in recording and promoting the works of outstanding nationals in the fields of sports, arts and culture. More recently CCST has completed a publication addressing the lack of material on Caribbean Icons in Science, Technology and Innovation (STI). Despite the strides in this area, there is a dearth of information on the accomplishments of Caribbean women in the area of (STI). This one-sided view that women have not excelled in the field of STI is partly responsible for the general lack of pride and support for STI in the region, as well as de-motivation of young women to pursue excellence in science and technology.

The Caribbean Women in Science and their Careers is a reference book that documents and promotes public awareness of the works and accomplishments of outstanding Caribbean women in the field of STI. It also provides information about their careers including what aptitudes and training are required to enter their professions. It is our hope that the book will shed new light on our heritage in science and in particular the accomplishments of Caribbean women in science. We hope that their stories will inspire students throughout the Caribbean region to follow in their footsteps.





Who is Camille Wardrop?

“When we empower and inspire girls to believe in themselves and dream big dreams... they will be the catalyst for positive and lasting change in their environment, country, and world.”

Ms Camille Wardrop Alleyne

Camille Wardrop Alleyne is an aerospace engineer, who has been committed to advancing aerospace and space technology development. With over 15 year experience in the field, she has been involved in the design and engineering of ballistic missiles and space vehicles that include the state-of-the-art Orion crew exploration vehicle.

She started her career at the National Aeronautics and Space Administration (NASA) Kennedy Space Centre, Florida where she operated and tested the equipment responsible for ensuring ideal environmental conditions for people and cargo in the Space Shuttle.

She is presently employed at the NASA Johnson Space Center, Texas. Her work on the Orion project involves collaborating with a team of engineers to design and develop the next generation of human space vehicles to replace the previous fleet. The design of this new crew exploration vehicle will have the capability to take astronauts beyond low earth orbit. She is responsible for ensuring that the Orion Crew and Service modules are tested and certified to meet its functional and performance requirements.

Camille Wardrop Alleyne was born on 12th October, 1966 in Port-of-Spain, Trinidad. She grew up with an innate curiosity about the wonders of space and the workings of airplanes. Her parents nurtured these interests as she was encouraged to take things apart and reassemble them. When things broke around the house, her mom called her to repair it. She also remembers sitting on the trunk of her dad’s car as a child star-gazing, thinking about outer space and how she could get there.

She advises students to embrace their talents and become future leaders and innovators.

Other Achievements

- Licensed private pilot
- Outstanding Woman in Aerospace awarded by the National Society of Black Engineers, 2010
- Certificate of Appreciation for the Transformation of the International Space Station to 6-person Crew Capabilities, 2009
- NASA Group Achievement Award for Constellation Requirements Development Team, 2007
- NASA Group Achievement Award for Exploration Systems Architecture Study, 2006
- Amelia Earhart Memorial Scholarship Fund Future Woman Pilot Award, 2006
- 2004 finalist (out of 4,000 plus applicants) in NASA’s Astronaut Selection Program for the position of Mission Specialist
- Special Merit Award, Ballistic Missile Defense Organization, 1999

What schools did she attend?

- Mucurapo Girls’ RC School, Trinidad
- St. Francois Girls’ College, Trinidad
- Howard University, USA – Bachelor of Science in Mechanical Engineering
- Florida A&M University, USA - Master of Science in Mechanical Engineering

CAREER INFORMATION

Aerospace Engineer

What is a Aerospace Engineer?

Aerospace engineers research, design and build the machines, parts, materials and technologies used in space exploration, aviation and defence systems. They work on spacecrafts, aircrafts and missiles – all complex, high-tech machines.

They work in engineering teams focussed on a specific part of the vehicle or missile, such as the structure, propulsion system, instrumentation or integrated systems. The teams work to build vehicles (and weapons) that fly faster and further, but are lighter and more accurate.

Areas of specialisation

- Aeronautical engineering
- Astronautical engineering
- Systems engineering
- Aerodynamics
- Celestial mechanics
- Guidance and control systems

What do I need to study?

At CSEC and CAPE

- Biology
- Chemistry
- Physics
- Mathematics

A bachelor’s degree in aeronautical, astronautical or aerospace engineering is required. It is possible to study mechanical engineering first and then complete a master’s degree in aerospace engineering.

What skills and traits do I need?

- Teamwork
- Attention to detail
- Love for knowing how things work
- Design skills
- Computer savvy

Fun Facts

Aerospace engineers work on airplanes that can weigh over a half a million pounds and spacecrafts that can travel over 17,000 miles an hour.

Some famous Aerospace Engineers

- Sir George Cayley
- Wernher von Braun
- Barbara Johnson



Who is Patricia Carrillo?



“Engineering and construction is an interesting and rewarding career and girls have the same academic ability as boys to succeed.”

Professor Patricia Carrillo

Professor Patricia Carrillo is the Chair of Strategic Management in Construction in the Department of Civil and Building Engineering at Loughborough University, England. She also holds the position of Postgraduate Programme Director for the department's long-running and successful MSc programmes in Construction Management and Construction Project Management. She is proud to be a professor at a highly regarded UK University. Most notably she was the first female member of staff at her department. She is a great inspiration to her students, especially since women in her undergraduate classes still comprises of less than 10 percent. She has supervised and examined PhD/EngD and Post Doctoral students in the UK.

Her career life has included involvement in numerous research projects and she has over 45 scientific publications in professional journals. In addition to her research work, she has contributed on the editorial board of various journals of knowledge management, engineering and construction and has published four books in her field.

What schools did she attend?

- St. Joseph Girls' RC School, Trinidad
- Holy Name Convent Secondary School, Trinidad
- The University of the West Indies, St. Augustine, Trinidad-
- BSc in Civil Engineering
- Loughborough University, England
- MSc in Construction Management
- PhD on Mergers and Acquisitions in the Construction Industry

Professor Carrillo was born on the 6th May, 1962 at the Port-of-Spain. She was eldest of three children, one of whom was disabled, to parents who only had attended primary school education. She fondly remembers spending her holidays in the country with family. Despite not having any role models or a career plan growing up, her parents stressed the importance of getting a good education. Even though her A- Level results were disappointing, she continued her education and came second in her class for her bachelor's degree and topped the class for her master's degree.

She feels that attaining her university degrees definitely opened up doors for her career. She believes that teaching in the field of construction management is an interesting and rewarding career and advises students to keep on persevering even if they do not get the results they expect the first time.

Other Achievements :

- Awarded a British Council Scholarship that allowed her to do her postgraduate work in the UK.
- She received The Royal Academy of Engineering Global Award.
- Awarded Best Research Paper, The Chartered Institute of Building
- Awarded Best Peer Reviewed Paper, American Society of Civil Engineers

CAREER INFORMATION

Construction Manager

What is a Construction Manager?

A construction manager is responsible for all aspects of a construction job, including planning, coordinating, and supervising the job from start to finish. The goal is to ensure completion according to quality standards, budget, time and scope.

The manager advises on design and construction; and oversees schedules, budgets and costs.

Areas of specialisation

- Design management
- IT
- Legal issues
- Health And Safety
- Risk
- Quality management

What do I need to study?

At CSEC and CAPE

- Chemistry
- Physics
- Mathematics

At the tertiary level, one must do a degree in civil engineering or a related engineering field, followed by a master's in construction management.

What skills and traits do I need?

- Attention to detail
- Patience and concentration
- Good language and communication skills
- Reasoning
- Integrity/Honesty
- Time Management
- Stress Management
- Safety Conscious

Fun Facts

She enjoys spending holidays with her family and playing squash.

Professor Carrillo is the mother of twins, her daughter has shown an interest in science and she has been happy to encourage her in the field.

Some famous Construction

Stephen Bechtel
Thomas Andrews



"Always do what you love, once you are passionate about something. It then feels effortless and becomes fun."

Dr. Shirin Haque



Who is Shirin Haque?

Shirin Haque is the first female Head of the Department of Physics at the University of the West Indies. She is renowned for spearheading the advancement of Astronomy at The University of the West Indies, St. Augustine. This astronomy lover has research interests that include quasars, cosmology, large scale structures, spin glasses and psychophysics. Her earlier work focussed on theoretical Astronomy, the distribution of galaxies and possible blueshifts in quasars.

She is the co-founder of two organisations, the Caribbean Institute of Astronomy (CARINA) and the Society for Physics Advancement Research and Collaboration (SPARC). She is responsible for starting an observational astronomy programme at St. Augustine, in collaboration with the University of Turku in Finland. This was listed as one of the top 100 science projects by Discover magazine in 2008.

Dr Haque believes in the importance of education and is described as an excellent teacher, mentor and role model to all persons, especially young women in society. She was the first in the department to make her courses available online and has introduced a new course in Astronomy for non science majors. She has also served the local community through astronomy workshops for teachers, providing career guidance to high schools and participating in various other science based activities including numerous public lectures in Astronomy. She was the co-chair of the International School for Young Astronomers (ISYA) held in Trinidad in 2009 which had participants from 17 countries.

What schools did she attend?

- St. Joseph TML School, Trinidad
- St. Augustine Girls' High School, Trinidad
- The University of the West Indies, St. Augustine, Trinidad
- BSc in Physics
- MPhil in Physics (Astronomy)
- PhD in Physics (Astronomy) – Split site degree with University of Virginia, USA
- She is currently pursuing an MPhil in Psychology to merge the concepts of Psychology with Physics.

One of her latest projects, in collaboration with universities in the USA, Canada and Finland, is on astrobiology at the pitch lake and mud volcanoes in Trinidad. It has caused a lot of interest and has been featured by BBC and Discovery Channel.

Shirin Tabassum Haque was born on 1st December, 1964 in Patna, India. Her father was a plant virologist and was offered a position at UWI. This resulted in her moving to Trinidad at age 7 with her parents. She was unable to speak any English at the time and she had no formal schooling before this. As a young child, whenever she had a pair of binoculars in her hands she always pointed it at the sky. She fondly remembers using it to look at the moon and being blown away by its beauty.

Dr Shirin Haque is a frequent contributor to television and newspapers with interviews on topics of Astronomy. She produced the first science documentary in High Definition in the Caribbean entitled "Adventures in Discovery" which was released in 2008. In 2010 the second feature "All is Number" on the role of Mathematics in all things around us was released and she has begun work on a third documentary "Wild and Wonderful" on the flora and fauna of the region. These features are aired across the Caribbean and used in several schools. They are available online at www.uwiphysics.co.nr. She advises that "there is so much in the natural world just waiting to be discovered. Never lose your childlike curiosity and fascination with things."

Other Achievements :

- Her PhD thesis on "Clustering of Galaxies in Pisces-Perseus" was awarded the most outstanding thesis award.
- Vice Chancellor's Award for Excellence in Teaching 2005 - UWI
- Fellow of the Royal Astronomical Society (RAS)
- Distinguished teacher award from Association of Atlantic Universities -- 2004

CAREER INFORMATION

Astronomer

What is an Astronomer?

Astronomers use physics and mathematics to learn about the nature of the universe. They study celestial bodies such as the sun, moon, planets, stars, and galaxies. Modern astronomers spend a lot of time processing and analysing data. They develop their own computer programs and analysis techniques. Others work with radio telescopes like the Very Large Array to gather information.

The majority of astronomers spend their time conducting research. They also teach, design instruments, or work at an observatory. Their knowledge is used to solve problems in navigation, space flight and satellite communications, as well as to develop new instruments and techniques to observe and collect astronomical data.

Areas of specialisation

- Aesthetic dentistry
- Endodontics
- Forensic odontology
- Orthodontics
- Oral pathology
- Oral and maxillofacial radiology
- Oral and maxillofacial surgery
- Public dental health
- Periodontics
- Prosthodontics
- Paediatric dentistry

What do I need to study?

At CSEC and CAPE

- Biology
- Chemistry
- Physics
- Mathematics

Since astronomy is a subfield of physics, you must first obtain a bachelor's degree in physics. Astronomers typically have a doctorate in physics or astronomy.

What skills and traits do I need?

- Technological savvy to build instruments
- Problem-solving and analytical skills
- An inquisitive mind and imagination
- Ability for abstract thinking
- Reasoning
- Observation skills
- Patience and determination
- Strong computing and communication skills

Fun Facts

She enjoys spending holidays with her family and playing squash.

Professor Carrillo is the mother of twins, her daughter has shown an interest in science and she has been happy to encourage her in the field.

Some famous Astronomers

- Galileo Galilei
- Johannes Kepler
- Tycho Brahe
- Caroline Hersche
- Vera Rubin
- Maria Mitchell
- Edmund Halley





Who is Camille Selvon Abrahams?

“Education is key to personal fulfilment...I would advise all young people to embrace technology, as this is our future and it is necessary for all forms of communication. Animation is an exciting field and it is now possible to be trained properly in it.”

Camille Selvon Abrahams

Camille Selvon Abrahams is an internationally recognised animator and multi-media producer. She is the founder and creative director of the Caribbean's first animation and new media festival - Animae Caribe Animation and New Media Festival. She also founded the Full Circle Production Animation Studio, a state-of-the-art production and training facility for young animators. Under her creative direction, animators from the studio and other countries are producing an animation series for television entitled, “The Anansi Chronicles”.

Mrs Selvon Abrahams is the current programme administrator and lead lecturer in animation in the Digital Media Department at The University of Trinidad and Tobago. She spent several years in the United Kingdom honing her skills in animation and multi-media production before returning home to develop the industry in the region. She was production assistant to Oscar-nominated British animator, Erica Russell, and to Osbert (Ossie) Parker, three-time British Academy Award nominated director.

What schools did she attend?

- Maracas RC Primary School, Trinidad
- St Joseph's Convent, St. Joseph, Trinidad
- Goldsmiths, University of London – BA in Media and Communications

She has received several accolades for her work. Her final year project, a short animated film titled, “The MasterPEACE”, won the Royal Television Society Student Award in 2000. The film was shown at international festivals such as the Miami Webfest, the Hiroshima Animation Festival and the Women in Animation Festival in London.

Camille Selvon Abrahams was born on 25th March, 1968 and grew up in the village of La Seiva, St Joseph, Trinidad. Her childhood fostered creativity as her father routinely told stories of Anansi and Brer Rabbit. This tradition of storytelling, coupled with the absence of television in the home until the age of 14, was influential in moulding her creative and artistic abilities. As a parent, Mrs Selvon Abrahams was disappointed by the lack of creative and innovative materials available on television for children. This propelled her to venture into the field of animation.

Her advice to students is, “always strive to do what you love and love what you do, especially when it comes to a career.”

Other Achievements

- Short-listed for the Commonwealth Vision Award for her short film “Body Language”, 2004
- Awarded Best International Participant in Taiwan’s “Bridging the Digital Divide”, 2008
- Commissioned by the Trinidad and Tobago Film Company for the animated film “The Vegetarian Super Machine”

What is an Animator?

Animators are individuals who use art to create a sequence that tells a story or conveys a message. They create multiple images which, when displayed in rapid succession, form an illusion of movement. This is what is termed an “animation”.

Animators take ideas and create drawings and bring them to life in movies, television shows, video games, advertisements and educational programmes. While animators may use computer programs to draw and animate, they must understand the fundamentals of drawing. They work alone or in teams to put drawings together with soundtracks, story lines, layouts and special effects.

Areas of specialisation

- Character animation
- Special effects animation
- 2-D computer-generated animation
- 3-D computer-generated animation
- 2-D hand-drawn animation

What do I need to study?

At CSEC and CAPE

- Art
- Computer Science
- Mathematics

While some animators are self-taught, most pursue tertiary education in areas such as graphic arts, fine arts, industrial design, computer programming, 3-D design, and multi-media design.

What skills and traits do I need?

- Creativity and imagination
- Good drawing and modelling skills
- Attention to detail
- Patience and concentration
- Good computer skills
- Good teamwork skills
- Be flexible and open-minded



Fun Facts

She met her future husband at the airport while picking up her aunt.

Some famous Animators

Walt Disney
William Hanna

Who is Merle Henry?



"I was doing a job in what was then a man's world"

Merle Henry

Merle Henry was one of the first female pharmacists in Trinidad and Tobago. She grew up in an era in which women were excluded from the elite circle of scholars who studied science. Despite this, she went on to have a long and successful career in pharmacy - a profession that is critical to the provision of healthcare.

Ms Henry joined the public service as a pharmacist at the Port-of-Spain General Hospital in 1951. It took four years for her to be confirmed in the post. In an interview with Angela Pidduck for the *Newsday*, she recalled that, "There were no vacancies at the time. Bureaucracy was negatively at work for me and I was doing a job in what was then a man's world."

Serving as a pharmacist in the public service, she was moved to different hospitals. Her work included tutoring and guiding student pharmacists, and having to decipher prescriptions written by doctors in Latin abbreviations. Medicines in those days also had to be prepared by the pharmacist. She broke new ground when she was promoted to the post of Acting Assistant Senior Pharmacist and was later appointed Senior Pharmacist. She retired in this post in 1980.

What schools did she attend?

- St Margaret's Primary School, Trinidad
- Bishop Anstey High School, Trinidad

Not one to stay at home and be idle, she joined Oscar Francois Ltd as a pharmacist and worked there for 13 years. She later joined J.N. Harriman & Co. Ltd., where she remained employed until June 2008, when she finally retired as a registered pharmacist after 62 years in the profession.

Alice Merle Stanley Henry was born on 17th September, 1920 in Belmont, Trinidad. Initially, she wanted to study architecture but instead followed her mother's advice that a career in pharmacy would be more rewarding. On completing secondary school, she apprenticed at the Royal Pharmacy in Port-of-Spain and was the only female apprentice in the country. In one year, she was promoted to the post of assistant pharmacist, and a year later, she joined W. C. Ross & Co. Ltd., a leading pharmacy at that time.

Merle Henry served as a faithful member of the Young Women's Christian Association and the Port-of-Spain Soroptomist Club. Her life philosophy can be summarised in her own words, "You have all my future in your hands, Lord. I need you to guide me every step of the way." She passed away on 5th August, 2008.

Other Achievements

- She started as an apprentice with W.C. Ross & Co. Ltd. and was promoted to pharmacist on attaining her Diploma in Pharmacy after five years of study.

CAREER INFORMATION

Pharmacist

What is a Pharmacist?

Pharmacists are trained professionals who provide expert advice to the public about the use, preparation, supply and effects of medicines.

Their day-to-day work includes preparing, mixing and dispensing medicines; giving advice to doctors and patients on the usage, dosages and side effects of medicines; checking the dosage and possible interactions between different medicines to safeguard patients' health and safety; and buying and distributing medicines for hospitals and health centres. Pharmacists working in industry conduct research to develop new and improved medicines.

Areas of specialisation

- Pharmacy practice
- Pharmaceutics
- Clinical pharmacy
- Compounding pharmacy
- Veterinary pharmacy

What do I need to study?

At CSEC and CAPE

- Biology
- Chemistry
- Physics
- Mathematics

To become a licensed pharmacist, one must have a degree in pharmacy, complete a year's training in community or hospital pharmacy, and pass the registration examination.

What skills and traits do I need?

- Interest in chemistry and health care
- People and communication skills
- Accuracy and attention to detail
- Problem-solving skills
- Record-keeping and organisational skills



Fun Facts

Despite having no prior exposure to chemistry, she passed her first pharmacy examinations with an impressive 100 per cent mark.

She was referred to as "the oldest working pharmacist in Trinidad."

Some famous pharmacists

William Proctor Jr
George F. Archambault