



2026

EUREKA!

FACULTY OF SCIENCE AND TECHNOLOGY



MATH FAIR 2026



THE NEW FST PEER ADVISORS



BIOBLITZ 2025

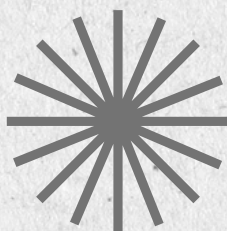


Take a peek inside!

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FST Website:
<https://sta.uwi.edu/fst/>



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MESSAGE FROM THE EDITOR

Greetings!

What an absolute pleasure to be back to producing another issue of “Eureka!” after a gap of several years. I like to think of it as “Eureka 2.0!” This magazine is a peep into the world of the Faculty of Science and Technology at the University of the West Indies, St. Augustine from all angles and the amazing people who turn the wheels to make it all happen, whether it is the academic staff, the non-academic staff and most importantly the students. In this issue, you meet the new dean Prof. Adesh Ramsubhag who has been appointed this academic year 2025/2026 and his team of deputy deans in the different portfolios.

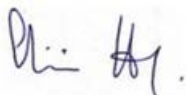
There are so many amazing things happening in each of the five departments: Chemistry, Computer Science, Mathematics, Life Sciences and Physics. You get to experience an aspect of all of them—whether it is through the research being done, the publications, the outreach activities, profiling certain staff and through the voice of the students. We are delighted that our feature article is on some of the impacting research being done by the former deputy dean of outreach—Dr. Terry Mohammed. Of special mention are the peer advisors—a group of students who came highly recommended by academic staff to be trained and serve as the linkage in the faculty between students and staff, some of whom serve as part of the editorial team for this issue. You can meet them on page 9.

So, through the pages of this magazine—enter into the magnificent world of the Faculty of Science and Technology. We hope you enjoy your journey with us! I would like to leave you with some food for thought through a quote, by one of my favourite scientists, which embodies the spirit of some of what we hope to emulate through this magazine.

“Our species needs, and deserves, a citizenry with minds wide awake and a basic understanding of how the world works.”

- Carl Sagan, *The Demon-Haunted World*

Stay curious!



Prof. Shirin Haque
Editor-in-Chief

EDITORIAL TEAM



Prof. Shirin Haque
Editor-in-Chief



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WHAT'S ON THE COVER?

Rooted in the Cosmos

The front cover features a piece entitled “Rooted in the Cosmos”, done by PhD Biochemistry candidate. In this piece, “Rooted in the Cosmos”, each element represents a department within the faculty: the sunflower—Life Sciences; the Fibonacci spiral—Mathematics & Statistics and Computing & Information Technology; the test tube—Chemistry; and the galaxy—Physics. The composition illustrates how distinct fields of study form an interconnected academic community.



Sian Ramdass is a PhD Biochemistry candidate in the Department of Life Sciences. Her research explores nature-inspired cancer therapeutics, investigating the anticancer potential of plant extracts, including traditional bush medicine. Sian loves creating botanical art, motivated by her fascination with nature and as an extension of her scientific work.

PROF. ADESH RAMSUBHAG: *DEAN WITH A VISION ON A MISSION*



The Faculty of Science and Technology welcomes its third dean since its inception in 2012 following in the giant steps of the first dean, Prof. Indar Ramnarine laying the ground work for this new faculty, followed by the notable contributions of Prof. Brian Cockburn navigating the faculty through the difficult times of the Covid-19 challenges to academia and education. We now welcome Dean Adesh Ramsubhag who comes with a formidable academic record in administration and research having served as Head of Department of Life Sciences and Deputy Dean for graduate studies and research in the faculty already.

He is also the recipient of the prestigious Anthony Sabga Caribbean Awards for Excellence in Science and Technology, the Vice Chancellor's award for excellence in research and most recently the best researcher award at the St Augustine campus at UWI among several other awards.

It would be easy to be intimidated by someone of his calibre and yet, when you meet Prof. Ramsubhag, none could be more approachable, humble or down to earth than this man of the people. He comes from humble beginnings in farming and that connection between the environment and humanity has never left him. As he nears the end of his first year in office – his vision of leading the Faculty of Science and Technology is clear. The priority is research, research, and research! With this mission in mind, a research retreat was held in April 2026 – the first of its kind in our faculty. At this retreat, there was a strong focus on interdisciplinary research agenda and aggressively going after funding for the faculty. Along the way, he has continued to focus on the human element of health and wellness, community outreach and lifting up everyone in the faculty regardless of their position and portfolio. Working alongside Dean Ramsubhag, one is reminded very much of the philosophy of Gandhi when he said “You must be the change you wish to see in the world.”

*“You must be the
change you wish to see in
the world.” - Gandhi*

MEET THE DEPUTY DEANS

What do you enjoy most about your career?



Dr. Michael Forde - Deputy Dean for Facilities Management

"Seeing the eyes of students when they have that Eureka moment and realize that they understand the chemistry!"



Prof. Shirin Haque - Deputy Dean for Outreach

"Science is truly mind-blowing-with so much discovery in this era impacting all our lives. Sharing that science through outreach is my dopamine kick!"



Prof. Jayaraj Jayaraman - Deputy Dean for Graduate Studies

"I am passionate about working for researchers for their intellectual stimulation and success, and towards fostering a strong research-culture-driven academic community."



Dr. Denise Beckles - Deputy Dean for Student Matters

"Helping students to see alternative paths to their chosen destination."

THE PRICE OF BEAUTY

A Caribbean perspective

The Caribbean is a highly diverse, multi-ethnic region shaped by indigenous roots, European colonization, the African slave trade, and Asian indentured labor. Major groups include Afro-Caribbean, Indo-Caribbean, Hispanic, European, Chinese, and Indigenous (Taino/Kalinago) populations. The Indo-Caribbean population constitutes approximately 35% in the southern states of Trinidad and Tobago, Guyana and Suriname, while the Afro-Caribbean population exceeds 90% in most of the other islands of the region.

Skin lightening practices such as the use of skin lightening or bleaching creams have been commonly used by individuals with darker skin tones from the African and East Indian populations. In these populations and among many others, a lighter complexion is deemed more beautiful, signifies a higher social status and enhanced economic mobility. Studies show that skin bleaching is on the rise and is more prevalent among females and research has also found that skin bleaching is more prevalent among women with higher academic achievement who are more prone to seek professional employment. This is further supported by studies in hiring practices where lightly colored individuals have a statistically higher chance of being hired than darker colored persons. There is evidence that the existence of pigmentocracy, particularly in Jamaica and Trinidad and Tobago, is a driver for skin bleaching in the region.

The use of skin bleaching creams in the Caribbean is not restricted to women only but also to men who are seeking a lighter skin complexion. In 2011, a famous regional singer launched his own line of skin whitening products to add to the already popular men's line of skin whitening creams, and his wife launched a similar line in 2021. Lighter skin not only enhances the perception of greater attraction but also enhances the appearance of tattoos skin as the darker coloured tattoos contrast better with light skin than dark skin.

USE OF MERCURY IN SKIN BLEACHING CREAMS

Mercury exists in inorganic, elemental, and organic forms. Ammoniated Mercury ointments were commonly used for the treatment of psoriasis, but cases of nephrotic syndrome and neurological defects have also been reported. Ammoniated Mercury was first studied as a skin lightening agent when it was found in 1952 that the ions reduced melanin

production and resulted in lighter skin tone.

More recently, Methylated-Mercury compounds have been used in some skin-lightening products from

Jamaica. Mercury inhibits production of the skin pigment Melanin in Epidermal Melanocytes by inactivating Sulfhydryl Mercaptan enzymes, which leads to the subsequent inactivation of Tyrosinase, a critical enzyme in Melanin production. The forms of Mercury commonly used in skin-lightening products include; Ammoniated Mercury, Mercury Iodide, Mercurous Chloride, Mercurous Oxide, or Mercuric Chloride.

Mercury absorption can occur through inhalation, dermal absorption or orally, as advised in some products. The main factors influencing dermal absorption are the amount and the frequency of application and the skin layer hydration. Other factors affecting the rate of Mercury absorption are external temperature and skin thickness.

Long-term exposure to Mercury caused by repeated applications can lead to damaging impacts to skin, nervous system and kidneys. Dermal effects following Mercury-related skin-lightening products include scarring, skin discoloration, and rashes. Additionally, Mercury may cause skin-related diseases such as contact dermatitis, pink disease (Acrodynia), and Mercury Exanthema.

Neurological effects relating to Mercury in skin-lightening products are headaches, tremors, ataxia, irritability, numbness, paranoid delusions, depression, and insomnia. Renal effects include nephrotic syndrome—a non-specific kidney disorder characterized by oedema, proteinuria, albumin, and globulins. Mercury toxicity affects unborn children when their mothers use Mercury-related creams on their bodies. Ricketts et al. confirmed that pregnant women using creams with Mercury can transfer Mercury to the child; a case in Belgium indicated that high levels of Mercury in a pregnant woman's urine and blood were also traced to her infant. Furthermore, in November 2022, as reported in CNN Edition, a mother lost her peripheral vision from clear exposure to Mercury in beauty creams and the toxic levels in her home placed her entire family at risk.

Although there have not been any reported cases of Mercury poisoning due to skin creams in Trinidad and Tobago, this does not mean that they do not exist, since the symptoms can be easily mistaken for common psychological and medical disorders. Literature has discussed at length the adverse health effects of skin-lightening creams. One study found that repeated applications of skin-lightening products with high Mercury content were associated with kidney damage. A recent systematic review using 832 individuals from Kenya, the United States (US), Jamaica, and Hong Kong found that nine individuals from Kenya experienced tremors, lassitude, vertigo, and neurasthenia. In Jamaica, 139 individuals reported itchiness, irritability, and other effects such as headaches, depression, and in the US

and Hong Kong the most frequently reported outcomes include fatigue, nervousness/irritability, severe headaches, depression and anxiety, weakness, insomnia, memory loss, tremors, and body/joint pain. In Barbados, a study of Mercury levels in hair of individuals revealed four women with Mercury levels ranging between 361–5617 $\mu\text{g/g}$ inorganic Mercury due to the use of Mercury containing skin lightening creams.

REGULATIONS

The effects of Mercury on the human body are well known, and it has been well established that the use of Mercury and Mercury Compounds in skin lightening creams and products constitutes a hazard to users of these products. As such, many nations have instituted regulations governing the use of Mercury in cosmetic products either as a component or contaminant. The regulatory limits set by various nations varied from 0 $\mu\text{g/g}$ to 3 $\mu\text{g/g}$ in the few countries that implemented such regulations; however, signatories to the Minamata Convention have adopted the limit of 1 $\mu\text{g/g}$ of Inorganic Mercury. The convention does not cover eye cosmetics that may use Thimerosal (an organic form of Mercury) as a preservative.

The United States Food and Drug Administration (USFDA) sets a limit of 65 $\mu\text{g/g}$ of total Mercury in eye cosmetics where no alternatives are present. Trinidad and Tobago is not a signatory to the Minamata Convention and currently has no regulatory limits for Mercury in products. However, the islands of the Caribbean who are signatories of the Minamata Convention have adopted the 1 $\mu\text{g/g}$ limit, but there appears to be little enforcement. Cosmetics often fall in the 'Grey Area' of regulation where it is neither considered a Food nor Drug, and as such are not governed by regional Food and Drug regulations and suffer from limited monitoring.

Mercury in bleaching creams is therefore not effectively regulated in the Caribbean due to weak enforcement of international bans, widespread illegal importation, and high consumer demand driven by colorism. While the Minamata Convention on Mercury prohibits Mercury in cosmetics, many products are unregulated, informally manufactured, or mislabeled, often containing toxic levels far exceeding limits.

THE WAY FORWARD

Regulating Mercury in skin-lightening creams involves banning products containing >1 ppm of Mercury per the Minamata Convention, enforcing strict import and manufacturing bans, and monitoring online market places. Effective regulation includes training customs agents, testing products with X-ray fluorescence (XRF), and raising public awareness about toxic ingredients.

- **Set The Legal Framework:** Implement national legislation to prohibit the production, import, and export of skin-lightening products containing Mercury above 1 ppm, aligning with Articles 3, 4 and 5 of the Minamata Convention.
- **Enforcement:** Train customs officials to identify and detain illegal and suspect products at borders.
- **Regulate:** Work with cosmetic retailers and e-commerce platforms such as Amazon, Facebook and Instagram to remove illegal products, enforce awareness about toxic ingredients and "prohibited product" policies, and hold platforms accountable for selling banned, Mercury-laden creams.
- **Monitoring:** Use analytical techniques, such as portable X-ray fluorescence (XRF) analyzers, and utilize regional universities and laboratories to detect Mercury levels in products in local shops.
- **Educate to Reduce Demand:** Launch campaigns to inform consumers about the health hazards of Mercury, how to identify hidden Mercury in ingredient lists (e.g., 'mercurous chloride', 'calomel'), and the importance of only buying products with clear "Mercury Free" labeling backed by third party testing.
- **International Cooperation:** Collaborate with international organizations, such as the UN Environment Programme (UNEP) and World Health Organization (WHO), to facilitate information sharing and joint action.
- **Build Healthcare Capacity:** Train healthcare professionals to recognize Mercury poisoning symptoms and report them, ensuring that medical personnel can take action to remove contaminated products.



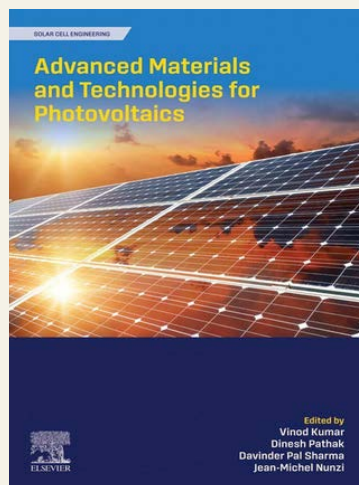
Dr. Terry Mohammed Ph.D., MBA, FRSC

Dr. Terry Mohammed currently holds the position of Senior Lecturer in Analytical Chemistry, Industrial Chemistry and Environmental Sciences at the Department of Chemistry at The University of The West Indies, St. Augustine. He specializes in Quality Assurance, Quality Management Systems, LIMS and Analytical Methodologies. Dr. Mohammed gained his B.Sc. in Analytical Chemistry from UWI, his Ph.D. from UWI and MBA from Harriot-Watt University of Edinburgh, and in May 2025 became among the region's few Fellows of the Royal Society of Chemistry.

Dr. Mohammed is currently a member of The Steering Committee for The Trinidad and Tobago Chemistry Olympiad, Vice President of the Trinidad and Tobago Chemical Society, Serves as Technical Auditor for the TTBS, and committee member for the PAHO/WHO Global program on elimination of mercury in skin-lightening products.

SOLAR ENERGY SOLUTIONS FOR RESEARCHERS

The recently published book by Elsevier, “Advanced Materials and Technologies for Photovoltaics” (December 2025) edited by Dr. Vinod Kumar, Dr. Dinesh Pathak and Dr. Davinder Sharma of the Physics Department, along with Prof. Jean-Michel Nunzi from Queen’s University in Canada, explores the transformative developments in photovoltaic energy conversion, offering insightful coverage on the theoretical and fundamental aspects of this field. The book delves into the diverse materials and technologies that drive innovation, connecting them with emerging applications that disrupt traditional energy paradigms. Catering to both seasoned and early-career researchers, this publication provides an accessible yet comprehensive guide to photovoltaic science, bridging the gap between foundational knowledge and cutting-edge advancements.



In addition to theoretical foundations, the book emphasizes practical tools, such as detailed sections on characterization techniques for solar cells and advanced modeling methods using software like COMSOL. It offers a balanced perspective on the intersection of materials science and photovoltaic applications, making it a crucial resource for researchers and professionals working on solar energy solutions.

YES, MINISTER!

The faculty is engaged with discussions with the Honourable Minister of Education Dr. Michael Dowlath in strategies to engage high school students and the faculty to explore STEM hands on initiatives—this is part of the proposal Youth Explorer’s Science (YES) Adventure initiative between the Ministry, the schools and the faculty. An MOU for this venture is currently under formulation.

GOVERNMENT AND FACULTY DISCUSS RESEARCH INITIATIVES

The Dean, Prof. Adesh Ramsubhag and deputy deans Profs. Jayaraj Jayaram and Shirin Haque met with the Minister of Planning, Economic Affairs and Development Senator Dr. the Honourable Kennedy Swaratsingh to engage in discussions of how the faculty can be supported in its research agenda to aid the government and the community with local entrepreneurship out of research in the faculty. The asphalt product developed in Chemistry Department was highlighted as well as the biofertilizers being developed in the department of the Life Sciences.

NEWEST PROFESSOR IN THE FACULTY

The Faculty toasts the latest appointment of professorship by Professor Sreedhara Rao Gunakala of the Mathematics Department. He has an outstanding academic careers panning three decades and encompassing teaching, research, and leadership



in Mathematics and Applied Computational Sciences. He is currently Head of the Department of Mathematics and Statistics at The UWI St. Augustine Campus. Professor Gunakala's research focuses on computational fluid dynamics, with applications spanning engineering, geophysics, and biomedical sciences. His areas of expertise include nanofluid flow modelling, biomechanics, couple-stress fluid flows, non-Newtonian fluids, convective heat and mass transfer, transport in porous media, magnetohydrodynamics, and fixed-point theory. His work has contributed to emerging biomedical applications such as magnetic nanoparticle hyperthermia for cancer treatment, cardiovascular diagnostics, and drug delivery systems. His contributions have been recognised internationally. The Royal Society of London awarded him the Commonwealth Science Conference Fellow Grant, and he has been a Principal Investigator on projects that have secured multiple grants from The UWI St. Augustine Campus Research and Publication Fund. In 2023, he received the Principal’s Research Award for Most Outstanding Faculty Researcher in the Faculty of Science and Technology. Since 2016, he has served as Vice President of the Latin America and Caribbean Congress of Theoretical and Applied Mathematics (LACCOTAM). (Adapted from *sta.uwi.edu news*).



FST PEER ADVISORS: BUILDING BRIDGES, FOSTERING GROWTH

Mentorship, leadership, and community—three words that capture the spirit of this year’s Faculty of Science and Technology (FST) Peer Advisor team.

The Faculty of Science and Technology proudly introduces its 2025 Peer Advisors—Shrima Boodoosingh, Haeley Parbhoo, Saleem Ramsamooj, Kareena Deokaran, Myah Williams, Gabriella La Rose, Varsha Roopchand, Che Pohlmann, Rayal Grant, and Rajeev Balgobin—a dynamic group of student leaders committed to uplifting their peers and enriching student life across the faculty. The team is guided by Prof. Shirin Haque, Team Coordinator, and Ms. Tsania James from the Dean’s Office, both of whom continue to play pivotal roles in the programme’s success.

The FST Peer Advisor Programme began twelve years ago and remains a cornerstone of mentorship and student engagement. A select group of students volunteer their time to support their peers with academic challenges, personal development, and the transition into university life—embodying the spirit of leadership and service that defines the faculty.

For final-year Biochemistry and Chemistry student Shrima Boodoosingh, the mission is simple yet meaningful: “I want to do more than just make an impact—I want to ensure students get the tools they need to succeed.” She hopes to help first-year students feel supported, seen, and capable. Haeley Parbhoo (Computer Science with Management, Year 2) emphasizes the value of consistency: “Always keep a schedule—it’s the best way to stay ahead of deadlines.”

Meanwhile, Kareena Deokaran (Computer Science and Mathematics, Year 4) encourages new students to embrace their strengths: “You are capable, resilient, and worthy of all the great things you set out for.”

Third-year Computer Science major Gabriella La Rose captures the heart of the programme best: “Being a Peer Advisor means being that approachable, reliable friend who makes university life a little easier and a lot more encouraging.” From Saleem Ramsamooj’s passion for science communication, to Myah Williams’s focus on creating holistic university experiences; from Varsha Roopchand’s drive to bridge communication gaps, to Che Pohlmann’s dedication to student wellbeing, and Rayal Grant’s commitment to fostering community—the 2025 team stands ready to serve.

Team Coordinator Prof. Shirin Haque commended this year’s group for their enthusiasm and dedication, noting that “peer advising continues to be one of the most impactful student-initiated initiatives within the faculty—built on empathy, collaboration, and growth.” As the academic year unfolds, the team looks forward to launching new initiatives designed to strengthen student engagement and support. Together, they carry forward the FST tradition of guidance, unity, and excellence—ensuring that no student ever feels alone on their academic journey.



MATHEMATICS- THE STRATEGIC FOUNDATION FOR NATIONAL SUCCESS

In the 21st century, nations are competing not only for natural resources and geography, but also for knowledge, innovation, and technological capacity. At the heart of this competition lies a powerful truth: mathematical knowledge drives success across all fields, but success in other fields does not necessarily produce mathematical strength.

Mathematics is not merely an academic subject confined to classrooms and examinations. It is the intellectual infrastructure of modern society. From artificial intelligence and cyber security to climate modelling and renewable energy, mathematics provides the language and tools that enable innovation.

The most compelling example is Artificial Intelligence (AI), the defining technological force of our era. AI influences healthcare diagnostics, financial systems, agriculture, logistics, smart cities, and education. However, AI is fundamentally mathematical. Its engines are built on linear algebra, probability, calculus, optimisation, and statistics. Without strong mathematical foundations, we cannot meaningfully design, regulate, or improve these systems; we can only consume them.

This reality has important policy implications.

If mathematics is treated as optional at the secondary level, we risk limiting our future workforce to users of technology rather than creators. In a region like the Caribbean, where sustainable development, climate resilience, digital transformation, and economic diversification are urgent priorities, mathematical literacy is not a luxury. It is a strategic necessity.

Mathematics develops analytical reasoning, structured problem-solving, and systems thinking. These are precisely the competencies required to balance complex national challenges: economic growth versus environmental sustainability, technological advancement versus cybersecurity risk, innovation versus regulation. Mathematical thinking trains individuals to evaluate evidence, interpret data responsibly, and make informed decisions.

Successful global innovators and technology leaders consistently demonstrate strong quantitative backgrounds. Their achievements are not accidental; they are built upon disciplined analytical training. While individuals may succeed in isolated domains

without deep mathematical expertise, sustainable technological progress and long-term economic competitiveness require a mathematically skilled population.

For policymakers, educators, and institutional leaders, the message is clear: mathematics education must be strengthened, modernised, and integrated with emerging technologies. Curricula should connect mathematical theory to real-world applications, such as AI, renewable energy, financial modelling, and biomedical engineering, so that students see mathematics not as abstract difficulty, but as practical empowerment.

Investing in mathematics education is investing in national capacity. It builds innovators rather than imitators. It equips young minds not only with technical skills, but with intellectual discipline and resilience.

Mathematical knowledge is a powerful catalyst for success, significantly broadening opportunities across disciplines and professions. In a data-driven world shaped by algorithms, analytics, and intelligent technologies, mathematics is far more than a single subject; it is the essential foundation upon which innovation, scientific advancement, and sustainable progress are built.

About the author:

Professor Sreedhara Rao Gunakala is a Professor of Mathematics at The University of the West Indies, St. Augustine Campus, specialising in computational fluid mechanics, nanofluid dynamics and applied mathematical modelling. His research integrates advanced numerical methods,



biomedical heat transfer, and artificial intelligence to address challenges in health, energy, and engineering, supported by competitive international research funding, including grants from the Royal Society.

He has served in senior academic leadership roles, including Head of Department, and has supervised numerous PhD, MPhil, and MSc students. Through his research, mentorship, and leadership, he continues to strengthen mathematical innovation in the Caribbean and beyond.



UWI MATH FAIR 2026: WHERE NUMBERS SHAPED THE FUTURE

IT IS FST...



Meeting with the Minister of planning, economic affairs and development



Dr. Phaedra Mohammed receives the Harold Ramkissoon award at the Caribbean Future of Science symposium



Faculty research retreat



Cricket





Christmas gift drive and pet supplies drive



BUSY AS A BEE...



Trailblazing Women of the Faculty of Science and Technology

Dr. Angela Shirley: 25 Years of Mathematical Excellence



A dedicated lecturer in the Department of Mathematics and Statistics, Dr. Angela Shirley has spent 25 years shaping mathematical minds at the Faculty. An expert in mathematical statistics and education, she is the author of the influential Foundations of Mathematics and Foundations of Classical Statistics textbook series. Her legacy includes serving as Convener for the 2009 CXC Additional Mathematics Syllabus development, where she helped bridge the gap between CSEC and CAPE levels. By promoting analytical thinking and precision, Dr. Shirley ensures students don't just learn math—they live it. As Aristotle inspires: "Excellence is not an act, but a habit."

Dr. Grace Sirju-Charran: 40 Years of Leadership in Science and Ethics

A trailblazing Senior Lecturer in Botany and Biochemistry, Dr. Grace Sirju-Charran was the first female appointed Lecturer in Botany and first female Head of the Department of Life Sciences. Over 40 years, her research on tropical tuber crops has yielded over 50 scientific publications. Her influence extends to bioethics, where she served on UNESCO's COMEST and co-founded the Bioethics Society of the English Speaking Caribbean. A recipient of the UWI Vice Chancellor Award for Excellence in Teaching, she developed pioneering courses in Gender and Science, and Bioethics. As Judith Butler states: "Gender is not what one is, it is what one does."



Dr. Indra Haraksingh: A Pioneer in Renewable Energy and STEM Education



For 14 years, Dr. Indra Haraksingh has been a transformative force in the Department of Physics. She developed and coordinated the first M.Sc. in Renewable Energy Technology in the Caribbean and has chaired the Trinidad and Tobago Mathematics Olympiad for over thirty years. Her international honours include the Life Pioneer Award for Renewable Energy and the Outstanding Scientist Award, while nationally she received the Humming Bird Medal Silver for Education. Her philosophy: "Embrace every opportunity that is presented to you; it may never return."

Dr. Margaret Bernard: A Visionary in Computing and Innovation

For 34 years, Dr. Margaret Bernard has shaped computing at the Faculty as a Senior Lecturer, former Head of Department, and former Deputy Dean. Her pioneering work includes BITREM, a fingerprint biometrics project that secured a U.S. patent, and AgriNetT, an award-winning e-agriculture platform.

She played a pivotal role in establishing the Department of Computing and Information Technology, giving computing its own space to thrive. Her greatest pride lies in her students: "My greatest impact was nurturing our students to see their potential for positive impact wherever life leads them."



Caribbean Future of Science Symposia: *Bridging the Caribbean, diaspora and the international scientific community*

The Caribbean Future of Science project is the brainchild of Professor Stephon Alexander, physicist, jazz musician and author from Brown University in the United States. He is a member of the diaspora who left Trinidad and Tobago as a child but dreams of Trinidad and Tobago never left him. As a long-time collaborator of Professor Shirin Haque in the Department of Physics in the Faculty of Science and Technology, he partnered with her to bring to fruition a long-standing vision of his. He serves as Director and Founder of the project with Professor Haque acting as the Principal Investigator (PI). So, the Caribbean Future of Science project was born in 2023 generously supported by the Simons Foundation to the University of the West Indies which funds initiatives in the pure sciences. It was a three year project supporting conferences annually that brought the international community, the diaspora and local and regional scientists in a 5-day unique collaboration and discussions in which music played a big part.

Each year from 2024- 2026 high school students and teachers also enjoyed parallel sessions of special education workshop for teachers and “Soca Science” segments for students. By 2025, the campus principal, Prof. Rose-Marie Belle Antoine was so delighted by the uniting of music and science, that she proposed a spin-off event for boys at risk. Thus in 2025, S.O.A.R. (Sound-Originality-Aspire-Resilience) youth summit was held at Hilton in Port-of-Spain for 28 boys aged 14-18 from rural areas, mainstream schools, and children’s home for two days of exposure to Science and music and empowerment by mentees who had walked the tough path in life to overcome the odds.

Each of the three symposia were chocked full of luminaries with 2016 Nobel laureate Professor Michael Kosterlitz attending each year and a cast of academic and musical celebrities including Grammy artists, television celebrities and authors and change makers at all the sessions. International premier institutions such as Harvard, Princeton, Yale, Imperial College to name a few were all represented and among our regional participants, over the years, Trinidad and Tobago, Jamaica, Barbados, Guyana, Honduras and Antigua all had representation.



2026 in Barbados



2025 in Tobago



2025 in Trinidad



2024 in Tobago

WE ARE LEARNING WHILE THE WORLD IS MID-UPDATE

Somewhere between unfinished lab reports, broken code, equations that refuse to balance, and the quiet panic that shows up around 2 A.M., most of us in science and technology have felt it in the sense that we are learning while the world is already moving on.

Not moving forward. Moving sideways. Diagonally. Unpredictably.

The future doesn't ask permission anymore. It refreshes itself mid-sentence, like a page with bad Wi-Fi. New tools. New threats. New opportunities. And we're expected to prepare for it using notes that were finalized before the update finished downloading.

Whether you're in computer science, physics, engineering, biology, chemistry, or any other corner of FST, the feeling is the same. We're told to specialize. To plan. To lock in a path. But the world we're graduating into doesn't reward rigidity, it punishes it. Automation is accelerating. Artificial intelligence is no longer "coming"; it's already sitting at the table, quietly rewriting the rules. Climate, energy, data, health, infrastructure, every system we study is under pressure, and none of them is behaving the way the textbook promised.

In computer science, this shows up as code that works perfectly until reality touches it. In the lab sciences, it's the experiment that fails three times before finally telling you something honest. In engineering, it's the moment the "ideal solution" collapses the second real constraints enter the room. Across disciplines, the lesson keeps repeating itself: knowing things matters, but adapting matters more.

What doesn't get enough credit is that this chaos demands creativity. Science and technology aren't sterile pursuits. They are messy, human, improvisational. Every model is a guess sharpened by evidence. Every system reflects choices. Every solution is shaped as much by what someone included as by what they left out. There is no such thing as neutral work. Even silence is a design decision.

As students, we are being trained not just to solve problems, but to sit inside uncertainty without panicking. To keep thinking when the data contradicts us. To keep building when the instructions are incomplete. To accept that failure isn't a flaw in the process, it is the process. The struggle isn't a sign you're doing it wrong; it's proof you're doing something real.

And there's weight to this. What we design, test, analyze, and deploy doesn't stay on paper. It leaks into real lives. Real environments. Real consequences. That means technical skill alone isn't enough. Judgment matters. Ethics matter. Curiosity matters. So does the courage to pause and ask the question that actually matters: This works, but should it? So here we are. Students in science and technology. Tired. Curious. Occasionally overwhelmed. Still showing up. Still asking questions. Still debugging the world one imperfect attempt at a time.

We are not graduating into certainty, and that's the point. The future isn't built by those who wait for certainty; it's shaped by those who learned to think clearly while everything was in motion. And maybe that's the real lesson of FST: not how to predict the future, but how to meet it mid-motion. How to think clearly while everything shakes. How to keep building when comfort disappears. Because the world won't slow down for us. But it will be shaped unmistakably by those who learned how to move with it.

Build anyway.



Ahmad Baksh is an undergraduate student in the Faculty of Science and Technology at The University of the West Indies. A recipient of multiple awards and special distinctions in English and writing, his interests include computer science, emerging technologies, and the role of creativity and critical thinking in a rapidly changing world.

FUN FACT: COMPUTER SCIENCE IS LIKE A PUZZLE CONSISTING OF LOGIC, ALGORITHMS AND CREATIVITY - ALL CLICK TOGETHER TO MAKE THE DIGITAL WORLD RUN SMOOTHLY.

QUOTE: "THE SCIENCE OF TODAY IS THE TECHNOLOGY OF TOMORROW."

- EDWARD TELLER



MEET RAJESH LAKHAN: THE FOUNDER OF MY STUDY COMMUNITY



MY STUDY
COMMUNITY



Mr. Rajesh Lakhani,
Teacher and Education Consultant
at My Study Community Limited

For more than fifteen years, I have taught mathematics at The University of the West Indies (UWI) and supported schools through Open Day, the UWI Math Fair, and other outreach activities. Across those settings—especially in conversations with teachers and mature students in the evening stream—one theme kept surfacing: guidance on the CSEC Form 5 Mathematics SBA that is precise, practical, and immediately usable in the classroom. To meet that need, I created the CSEC Mathematics SBA video series under My Study Community. The series is designed for both students and teachers and complements UWI’s mission to extend learning beyond the campus and serve the wider community.

Each episode demystifies a section of the SBA rubric by showing what strong work looks like and why it earns marks. To ground the guidance in authentic expectations, I examined CXC Mathematics subject reports, spoke with people who understand how SBAs are marked, and studied corrected SBAs alongside their written feedback. This series spotlights recurring

pitfalls: missing raw data, vague instructions, purposeless pie charts, and inconsistent tables of contents—and demonstrates quick fixes that immediately lift quality.

Several episodes focus on the rubric itself and on walking through full sample SBAs from weaker to stronger performance, so viewers can see precisely how marks are earned and where they are lost. Complementary segments address presentation and table-of-contents accuracy and show how to link conclusions back to the stated objectives. Together, these pieces form a compact, classroom-ready toolkit that teachers can assign or rewatch with students during SBA drafting and revision. Because the videos are open and asynchronous, they also help schools standardize expectations and save valuable contact time for targeted feedback and practice.

Equally important, the project functions as outreach. By making examiner-ready expectations understandable and actionable, it supports teachers who are mentoring dozens of students while guiding students who are building their first full project. In that sense, the series is a practical contribution to the secondary-to-tertiary pathway and to UWI’s regional service mandate. The resource sits alongside our in-person engagement—like the Math Fair and school visits—to extend impact beyond a single event into year-round support.

See mystudycommunity.com and the My Study Community YouTube channel

WILL NANOTECHNOLOGY MAKE THE WORLD A BETTER PLACE ?

Nanotechnology provides an opportunity to modify the properties of materials without doping or adding anything. Incorporating defects plays an important role in changing the properties of materials. Defects, i.e., faults, are of four kinds: first, because of doping; second, because of the misalignment of atoms; third, because of controlling arrangements— surface defects; and fourth, because of missing molecules. Among these, the third type—resulting from changes in atomic arrangements—leads to the formation of polycrystalline materials and if the size of those crystals is limited to less than 100 nanometers, it defines a nanomaterial and falls within the realm of nanotechnology.

Playing with arrangements at this scale—below 100 nm—by controlling the size and shape of these clusters, called grains, results in a multiple materials with diverse properties and hence, diverse applications. Gold, for instance, typically has a golden color, but through the beauty of nanotechnology, gold can be produced in many colors. The same applies to other materials like silver. This is the results of modified optical properties at such small dimensions. Various shapes and sizes—such as flower-like, rod-like, tube-like, and tetrapod-like structures—results in different properties without adding anything to the materials and results in very diverse applications, including more efficient solar cells, better conductors, highly sensitive sensors, and extremely hard materials.

Nanotechnology, which can be defined as the manipulation/playing of matter at the nanoscale (below 100 nm), takes advantage of the high surface area of materials. This technology provides the opportunity have applications of the advanced materials in fields such as nanomedicine, nanoelectronics, agriculture, biomaterials, energy production, and consumer products. However, there are some negative sides associated with this and one of the major concerns is the toxicity and trapping of such small scale materials in human tissue, resulting in illness.

As such small dimensional materials, or arrangements below 100 nm, that cannot be seen with the naked eye, advanced laboratories and characterization facilities are required, along with trained personnel who can manipulate such materials and correlate their properties with structure. This is typically done using tools such as scanning electron microscopes, X-ray diffraction, and atomic force microscopes.

Below the 100 nm threshold, there is another special class of materials known as quantum dots. Quantum dots show significant changes in their properties when even a small change is made in its size. This is very surprising as a small alteration of just 1–2 nm can result in vastly different properties and, therefore, different applications. There are many established techniques which can be used to produce such nanomaterials. Some involve breaking down larger materials into smaller ones (top-down methods), while others build materials atom by atom (bottom-up methods).

We also define a special class of nanomaterials called nanofibers, which has a fiber-like structure at a nanoscale, and can be used in water and air filtration, etc. During the COVID-19 pandemic, nanofiber masks helped protect people from the coronavirus. Although nanotechnology is not a new field, it remains highly competitive, and it is not an exaggeration to say that research in nanotechnology may help move the world toward a better living environment.

As far as a job market is concerned, more than 8% of jobs worldwide are related to materials-based research, and the Caribbean should also take lead in this area.

Dr. Dinesh Pathak serves as Head of the Department of Physics at The University of the West Indies, St. Augustine, Trinidad and Tobago. His primary research focuses on nanostructured compound semiconductors, oxide nanocomposites, ion beam synthesis of nanomaterials, organic semiconductors, and organic-inorganic hybrid semiconductor systems.



**FUN FACT: THIS MAGAZINE
IS COMPLETELY HUMAN
MADE!**

**QUOTE: WHAT A PRIVILEGE
IT IS TO BE EXHAUSTED BY A
CHALLENGE YOU CHOSE FOR
YOURSELF - MILES ADCOX**

Reflecting upon my journey - with

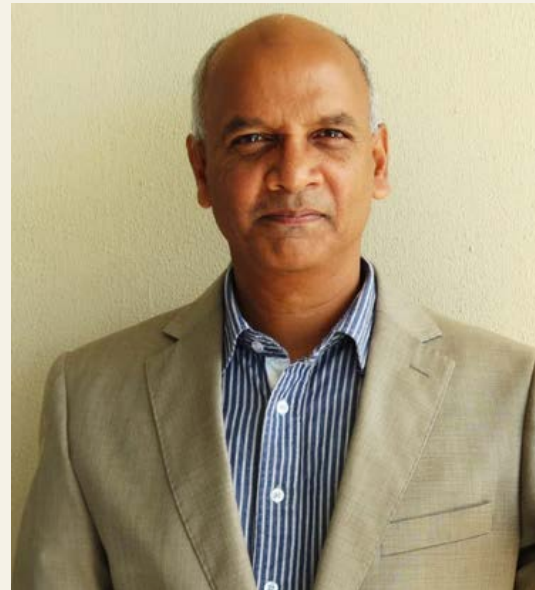
PROFESSOR PATRICK HOSEIN

This is a reflection on my roughly ten years within the Faculty of Science and Technology at the University of the West Indies, but first, some background. I was born near campus on Knowles Street in Curepe and attended the Curepe Presbyterian School, then St. Mary's College, where I won an Open Scholarship in Mathematics. Afterward, I spent a decade at the Massachusetts Institute of Technology (MIT) and earned five degrees. I briefly worked at Bell Laboratories before returning home to fulfill my scholarship requirements by lecturing in Electrical and Computer Engineering at the UWI. Later, I returned to Bell Laboratories, transitioned to AT&T Laboratories, and eventually moved to San Diego to pursue opportunities in the rapidly expanding field of Wireless Communications with Ericsson and then Huawei.

With my children entering university, I felt compelled to give back, so I returned to the UWI but this time joined the Department of Computing and Information Technology for a new challenge. One of my initial tasks was overhauling the MSc in Computer Science where I introduced Specializations, thus increasing flexibility to meet evolving educational demands. Recognizing the rising significance of Data Science and Artificial Intelligence, I also proposed and developed an MSc in Data Science, whose first cohort entered in 2019. This program has been growing rapidly especially with the recent surge in the use of AI tools.

Understanding the importance of research as well as coursework, I dedicated substantial effort in building a research culture. This led to the formation of the research group TTLAB, which is multidisciplinary (includes researchers from Data Science, Computer Science, Statistics, Mathematics, Electrical Engineering, Physics, etc.) and includes students at various stages of their path. In 2025 this group produced 32 journals and conference publications. I consider the early development of the MSc in Data Science, the teaching of graduate courses in this program and the supervision of research in areas such as AI and Optimization as my biggest contributions to the faculty.

Reflecting on my journey, I find that each phase, from innovation in industry (where I was granted 40 patents) to academic innovation to fostering collaborative research, has been worthwhile and I am grateful for being rewarded for my efforts with Trinidad and Tobago's highest award, the Order of the Republic of Trinidad and Tobago, in 2024. My hope is that the groundwork laid during my tenure will inspire future generations to pursue excellence.



**Professor Emeritus of Electrical Engineering and Computer Science,
Patrick Hosein**

Patrick Hosein has worked at Bose Corporation, Bell Laboratories, AT&T Laboratories, Ericsson and Huawei. He has published extensively with over 200 refereed journal and conference publications. He holds 40 granted patents in the areas of telecommunications and wireless technologies. He was nominated for the Ericsson Inventor of the Year award in 2004, was the Huawei US Wireless Research Employee of the year for 2007, is a 2015 Anthony Sabga Caribbean Laureate for Science and Technology, is a National Geographic Explorer and is a recipient of the Order of the Republic of Trinidad and Tobago (ORTT) award for 2024.

FUN FACT: UWI LINc CAN ACCESS MORE THAN JUST RESEARCH PAPERS AND CAN ACTUALLY ALLOW ACCESS TO MAGAZINES AS WELL!

QUOTE: "...JUST PICK ANYTHING IN YOUR SURROUNDINGS AND THINK DEEPLY ABOUT WHAT IT IS MADE OF AND DIG DEEPER; AND THE DEEPER YOU DIG THE MORE BEAUTIFUL THINGS YOU FIND...."
OMAR M YAGHI: NOBEL PRIZE IN CHEMISTRY 2025.

Q & A

WITH THE CHIEF RESEARCH TECHNICIAN SADIRA KHAN



Ms. Sadira Khan is the Chief Research Technician in the Department of Physics University of the West Indies St. Augustine Campus.

As the Chief Research Technician, she manages the day-to-day operations of undergraduate and postgraduate academic research laboratories, ensuring a conducive, safe, and efficient research environment. Her role involves close collaboration with faculty and researchers, providing essential support in procurement, laboratory infrastructure, and equipment management. She also supervises outreach, social media, marketing, and promotional events to enhance departmental visibility and engagement.

Q: WHAT DO YOU LIKE BEST ABOUT YOUR JOB?

A: I love interacting with the students and the satisfaction that comes from fostering a learning and creative environment.

Q: WHAT ARE SOME OF THE CHALLENGES YOU HAVE OVERCOME?

A: I am naturally shy and introverted. It has been a challenge to overcome social overstimulation from constant interactions at outreach events and the anxiety from public speaking in front of large crowds. I address this by understanding my audience, who are usually secondary school students, and focusing on serving them by providing the best advice I can offer.

Q: IS IT HARD BEING A CHIEF RESEARCH TECHNICIAN IN A PHYSICS DEPARTMENT, AN AREA WHERE WOMEN ARE UNDERREPRESENTED?

A: Luckily, at my department, the Department of Physics at the University of the West Indies, women are not underrepresented at all in the technical aspect. I have been fortunate to work alongside several ace female technicians, as well as numerous female academics. Together we created an atmosphere of support, camaraderie, and inclusivity.

Q: WHAT IS A LITTLE-KNOWN FACT ABOUT YOU?

A: When I'm not at work, you can find me at the gym, running a 5K, or watching movies with my family. I'm a proud wife and mother and always on the lookout for new adventures.

Q: ANY FUTURE CAREER PLANS?

A: I hope to pursue a PhD in an area that will have significant local and regional impact. Ultimately, I aspire to create a consultancy business aimed at innovation and sustainability

EXPLORE MICROBIOLOGY WITH DR. AARTI PUSTAM



Dr. Aarti Pustam, PhD Microbiology

I am a microbiologist at The University of the West Indies, St. Augustine campus, and I have dedicated my research to addressing one of the world's most urgent health crises- antibiotic resistance. My doctoral work, 'Molecular characterization of antibiotic-resistant *Klebsiella pneumoniae* from clinical and environmental sources in Trinidad, West Indies', represents the first comprehensive genomic study of the dangerous *Klebsiella pneumoniae* 'superbug' in the region.

Using advanced techniques such as polymerase chain reaction (PCR), whole genome sequencing, and shotgun metagenomics, I investigated over 500 isolates of *Klebsiella pneumoniae* collected from the four major hospitals across Trinidad. This research led to the first detection of critical resistance genes, including blaKPC and blaNDM-1, in local isolates, along with key virulence and mobile genetic elements that enhance pathogenicity and facilitate the horizontal transfer of resistance genes. The outcomes of this hospital-based phase inspired a second phase of research that extend beyond clinical settings into the natural environment. In this phase, a potentially polluted river was selected as the target site, where shotgun metagenomic analysis revealed more than 380 genetic sequences representing antibiotic resistance genes that are potentially circulating in the environment.

**"THROUGH MOLECULAR
MICROBIOLOGY AND GENOMIC
INNOVATION, I AIM TO CONTINUE
CONTRIBUTING TO THE SCIENTIFIC
COMMUNITY BY DEVELOPING
SOLUTIONS THAT SAFEGUARD BOTH
HUMAN AND ENVIRONMENTAL
HEALTH."**

This work bridged a critical knowledge gap for Trinidad and Tobago, laying the foundation for national antimicrobial surveillance and One Health initiatives that connect human, animal, and environmental health. It reflects my ongoing commitment to advancing diagnostics, guiding antibiotic stewardship, informing health policy, and raising public awareness about antimicrobial resistance. Through molecular microbiology and genomic innovation, I aim to continue contributing to the scientific community by developing solutions that safeguard both human and environmental health.

**QUOTE: JUST BECAUSE
SOMETHING DOESN'T DO WHAT
YOU PLANNED IT TO DO DOESN'T
MEAN IT'S USELESS. I HAVE NOT
FAILED, I'VE JUST FOUND 10,000
WAYS THAT WON'T WORK.**

- THOMAS A. EDISON

BIOBLITZ 2025

BAKE & BIODIVERSITY? DISCOVERING THE HIDDEN WONDERS OF MARACAS BAY

When we think of Maracas Bay, we tend to think of palm trees, waves and bake and shark. However, these days it is a much more sustainable choice to opt for a different species in your bake. Also, as we showed at this year's Bioblitz, Maracas has a lot more to offer than just a good beach lime.

On Saturday 20th September 2025, more than 250 scientists, naturalists and enthusiasts gathered at Maracas Bay Community Centre to embark on the most intensive biodiversity survey ever conducted in the area: a Bioblitz. Organised as a partnership between the Department of Life Sciences (DLS) and the Trinidad and Tobago Field Naturalists' Club for the last 14 years, and funded by First Citizens, the event consists of teams exploring a 5km radius area for 24 hours to record as many different species as possible: plants, birds, bugs, mammals, fungi, reptiles & amphibians, aquatic creatures and even microbes.

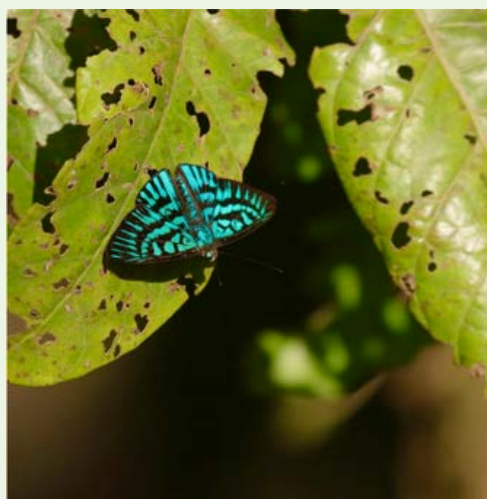
Among the volunteers were several school groups and an impressive turn out from the UWI Biological Society. On Sunday morning, basecamp was transformed into a Biodiversity Fair, with displays and activities from many different organisations, including our very own UWIZM. We welcomed visitors from all over T&T who had come to see the displays, as well as residents of the survey area itself, who had learned about the event through visits by the Bioblitz Outreach Team to schools and community meetings. We were delighted to welcome the Minister of Planning, Economic Affairs and Development, Dr Kennedy Swaratsingh, who was visibly impressed by both the mission of the weekend and the passion displayed by the participants.



Bioblitz Committee Members welcome Minister Kennedy Swaratsingh to Basecamp. To his left are UWI postgraduate Bryan Ramdeen and UWI alumni Jernella Chedick; Jernella was this year's Committee Chair. To his right are Dan Jaggernaut of the TTFNC and Dr Amy Deacon, Senior Lecturer in DLS and Scientific Coordinator of the event.

At 1 PM Sunday, an excited crowd gathered to hear the final totals: 14 mammals, 34 reptiles and amphibians, 48 fungi, 83 shellfish, 148 birds, 337 bugs and 419 plants! The announcement of a total of 1083 species was met with applause and cheers-the highest total of any Bioblitz yet and one that is sure to rise as we continue to count up some of the harder to identify specimens over the coming weeks. Maracas didn't provide us with any sharks (in the sea or in a sandwich), but it is certainly brim-filled with biodiversity!

Author: Dr. Amy Deacon



A metalmark butterfly (*Alesa prema*) that is rarely seen. This is one of only a handful of sightings of this species in T&T in recent years. Photo by Jason-Marc Mohamed

Some of the 250 volunteers at basecamp, just before we announced the grand total of 1083 species. Photo by J. Peters Images.



The Golden Tree Frog—an endangered species found only at high elevations such as the peak of El Tucuche. Photo by Zak Ali



Bioblitz Chair and DLS alumni Jernella Chedick and DLS Zoologist Dr Amy Deacon bring welcome remarks to the volunteers to kickstart the event at midday on Saturday. Photo by Bryan Ramdeen.



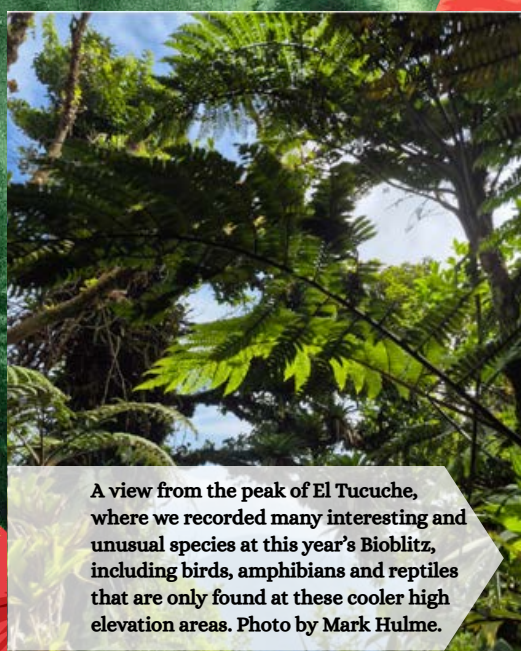
Giselle Ragoonanan shows visitors how she bands birds, such as this bananaquit, more about them. Photo by Amy Deacon



A Luminous Lizard, one of the species that made the list over the weekend. This species had not been confirmed from El Tucuche for 40 years. Photo by Zak Ali.



The Mammal Team, getting ready to leave Basecamp and set up their bat nets. T&T has 70 different species of bat, and 8 of these were recorded during the 24hrs. Photo by Bryan Ramdeen



A view from the peak of El Tucuche, where we recorded many interesting and unusual species at this year's Bioblitz, including birds, amphibians and reptiles that are only found at these cooler high elevation areas. Photo by Mark Hulme.



Herpetology volunteer Oneil Daniel handling a parrot snake that was caught in the area. All specimens were returned to the wild after the event. Photo by Bryan Ramdeen.



Members of the Fungi Team, led by Jeffrey Wong Sang, photograph some mushrooms so they can be added to the iNaturalist project. Photo courtesy Jeffrey Wong Sang.

WHAT IS THE MOST INTERESTING THING YOU LEARNT IN YOUR PROGRAMME?



Name: Sreedevi Dhawalaghar

Programme: BSc Physics

Objects traveling near the speed of light
experience length contraction

Name: Anesh Teemul

Programme : N1 Mathematics and Physics

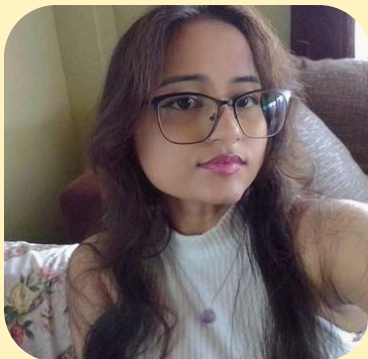
I learned to build and connect circuits in one of our lab sessions for physics which has given me a love for the subject of circuits and electricity.



Name: Shannon Madoo

Programme : BSc Biology (Year 1)

How organisms evolved, so much took place in order for us to reach here that its interesting to look back and see where we all started - primordial soup theory to now.



Name: Johann Baynes

Program: Double major in Physics and Mathematics

There are different sizes of infinity. We can classify what we can't conceive once the method is sufficiently roundabout.



Name: Sarika Chandoo

Program: PhD Chemistry with a focus on materials chemistry

A PhD is less a test of how smart you are but more about how well you handle ambiguity, setbacks and independence and your ability to persist despite the adversities you may face.

