

Science & Technology

Communications Newsletter



May 2021
First Issue –
Volume 1.1

A Warm Welcome from the Faculty of Science and Technology (FST)

A Warm FST Welcome to all our readers! Thank you for taking the time out to engage in our amazing world of Science, Technology, Engineering and Mathematics (STEM). Every aspect of our daily lives involves some form of Science and Technology, as our very existence depends on science, and we also use various devices created using technology at home and work every day. Through STEM, persons have endless opportunities to develop and provide creative, innovative and out-of-the-box solutions and new methodologies to solve both real world problems and difficult theoretical questions, while improving the lives of the people of the region. STEM also allows persons to develop various skills which can all be applied throughout their life, such as problem solving, logical thinking and analytical skills. All those skills can then be used to enhance their employability and their overall standard of living.

Main Purpose of the FST Communications Newsletter

This FST Communications Newsletter is the newest communication initiative of the FST. Its main purpose is to update and engage our various internal and external stakeholders on important news and notices related to FST and STEM, and highlight the different significant contributions our Faculty have been making to the advancement of STEM locally and within the Caribbean region, through our research and outreach.

Inside this Issue

• A Warm Welcome from the FST	1
• Main Purpose of the FST Communications Newsletter	1
• Brief History of the FST – From Inception to the Present	2
• Creation of the FST Digital and Communication Presence Team – FACT	3
• Creation of the FST Dean's Council	3
• Hosting of the 2021 FST Innovation and Entrepreneurship Day (FST NERD Day 4.0)	4
• Announcement of the 2020 Winners of the FST Innovation (FINO) Award Competition	4
• The Future of STEM and the FST – Perspectives from our Departments & Centre	5
• Perspectives from our FST Students	5-7
• Perspective from our FST Dean	7-8
	9
• The Value of Local Innovation in STEM	10



Brief History of the FST – From Inception to the Present

Sources of Information: Campus Archives – The UWI, Cave Hill Campus & FST Faculty Office

Sciences have been taught at the Cave Hill Campus of The University of the West Indies (UWI) from its inception in 1963. The FST has a proud history, having evolved from the Faculty of Natural Sciences, which began as a Division of Natural Sciences at the College of Arts and Science in Barbados in 1963. This was supported by correspondence between D. M. Smith and A. Z. Preston where the University put forward proposals in January 1963 to the University Grants Committee about the establishment of a College of Arts and Science in Barbados.

It was then elevated to a Faculty Committee in 1972 when Cave Hill became a full-fledged University campus of The UWI. This is evidenced by the fact that despite being referred to as the Faculty of Natural Sciences there was one Vice-Dean in many official records – i.e., Professor R. Binks, Vice-Dean, Faculty of Natural Sciences.

The end of using the name “Division of Natural Sciences” was recorded in correspondence dated October 17, 1972, when the Principal back then, S. L. Martin, noted that the Division of Natural Sciences at Cave Hill no longer existed. The Vice Dean, at the time, reported to the Dean of the Faculty of Natural Sciences at the Mona campus who had overarching responsibility for the faculty on all the landed campuses. It was not until October 1984, with the restructuring of The UWI, that the Faculty of Natural Sciences became a full-fledged Faculty with its own Dean - Mr. Bertram Callender.

The restructuring of the university was mainly intended to give its campuses significantly increased autonomy. So, for the cross-campus Faculties, this meant the separate elevation of the previous Faculty Committees at each campus to the status of Faculty Boards (Campus Boards), and the elevation of the respective Vice Deans to Deans of the Faculty.

Since our inception in 1963 and the restructuring in 1984, our Faculty has always strived for excellence in science through teaching, research, innovation and outreach. We remain committed to the development and application of the sciences. Our aim is to contribute to knowledge, and to shape the region's destiny. We also seek to open the world of science and technology to as many people as possible, redefining what a scientist should look like. With this in mind, we adopted the philosophy of “**Science for ALL**”. Through this philosophy, we strongly believe that Science should be made available to all who are interested, regardless of their income, gender or disability.



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Creation of the FST Digital and Communication Presence Team - FACT

The FST Digital and Communication Presence Team (FACT) was first developed in February 2021 with a focus on coordinating and improving our Faculty's communication by promoting, educating, informing, and engaging our students, staff and external stakeholders on details relating to our Faculty's latest research, initiatives, seminars and other Faculty's news and notices. Departmental Representatives from within the FST were nominated to form the FACT. The communication to be provided will use the principles of sound science communication to ensure that science concepts are expressed in a meaningful and understanding way. All of the Faculty's media outlets will also be used (such as the Faculty website and our social media pages).



Creation of the FST Dean's Council

On July 28, 2020, the Faculty received approval for the creation of the FST Dean's Council. The Dean's Council is designed to encourage meaningful participation from alumni and other relevant persons who have the interest, resources, knowledge and contacts to assist the Dean in the promotion of the Faculty's mission and priorities.

The Council will function as a working committee/group that supports the Faculty's goal of advancing STEM-related matters such as education, strategic planning, curriculum development and so on. Mr. Terrol Cummins – the Managing Director of Silver Technetium Capital Inc. will chair the Council, which will also include leaders from the public and private sectors (including FST Alumnus).

The main purpose of the Dean's Council will be to guide and assist the FST in mapping and rolling out a strategic work plan, designed to:

- drive a programme of activities that support the growth of the Faculty;
- assist in fundraising activities;
- provide an outside perspective on curriculum and research;
- be ambassadors for the Faculty with alumni, cooperations and other external organizations; and
- ensure full accessibility to the Faculty's programmes.



In Photo: Mr. Terrol Cummins
(FST Dean's Council Chair)

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Hosting of the 2021 FST Innovation and Entrepreneurship Day (FST NERD Day 4.0)



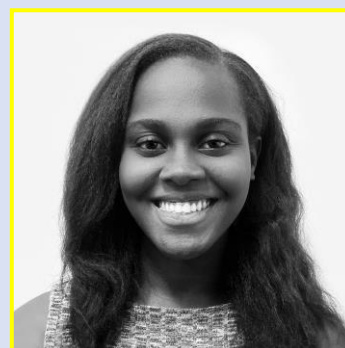
On Friday, February 26, 2021, FST hosted the 4th annual Innovation and Entrepreneurship Day (FST NERD Day 4.0). The event was held virtually (via Zoom) and featured the activities below:

- The launch of the FST Digital and Communication Presence Team (FACT);
- News on the Initiation of a FST Communications Newsletter;
- The announcement of the FST Innovation (FINO) Award Winners; and
- A presentation on Innovation and Entrepreneurship by Mr. Terrol Cummins – The Chair of the FST Dean's Council.

Announcement of the 2020 Winners of the FST Innovation (FINO) Award Competition

During our virtual FST Innovation and Entrepreneurship Day event held on February 26, 2021, we announced the winners of our FST Innovation (FINO) Award. The Faculty of Science and Technology (FST) Innovation Award (FINO Award) recognizes an innovative, out-of-the-box action, project or initiative performed by a student or students of the Faculty of Science and Technology. The award was offered for the first time in the 2020/2021 academic year, and it includes a special disabilities category.

There were two (2) prizes awarded during the FINO Award - Our FST Student - Ms. Kerri-Ann Bovell was announced as the 1st Place Winner of our FST Innovation (FINO) Award Competition; while our next FST Student - Mr. Damian Garnes was announced as the 1st Place Winner of the Disabilities Category of the award. The disabilities category will become its own award moving forward.



In Photo: Ms. Kerri-Ann Bovell



In Photo: Mr. Damian Garnes

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The Future of STEM and the FST

A BCS (Department of Biological and Chemical Sciences) Perspective:

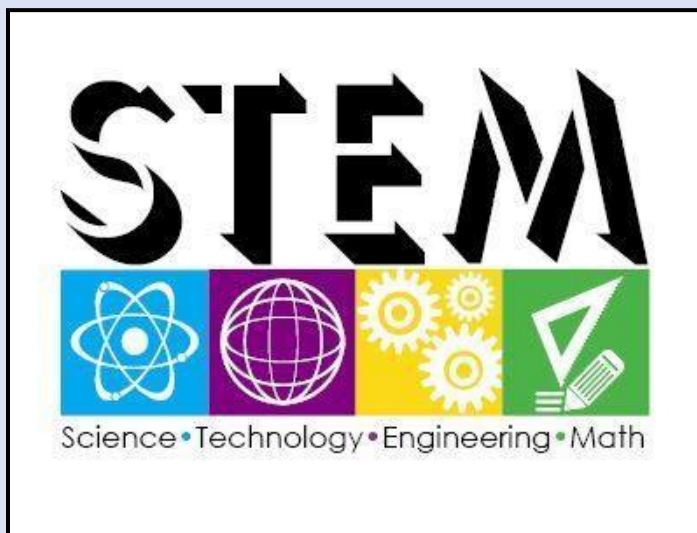
By Dr. Avril Williams - Head, BCS

I see the dynamic and interdisciplinary areas of STEM providing opportunities for staff and students to strengthen the quality and reach of undergraduate and postgraduate instruction, while diversifying and implementing innovative research programmes, that address local, regional and global challenges, through cross-Departmental, cross-Faculty and/or cross-Campus activities. Connections such as these, in conjunction with commercialization efforts, e.g., the Commercial Analytical Lab (CAL), rental of specialized spaces and consultancies, can expand our visibility and impact on campus, in communities and beyond, and allow for regular maintenance and upgrades to our facilities and instrumentation, while fostering corporate interactions and research collaborations.

The building of a diverse and inclusive working and learning community, where all are treated equitably and respectfully, and display the highest standards of moral and ethical values, can position the BCS Department and FST to respond to emerging opportunities (e.g., COVID-19, volcanic ash, and Sargassum seaweed) with integrity and accountability.

I see us fostering tomorrow's scientists through improved communication of outreach activities, awards and research discoveries, the provision of career mentoring and increased promotion of the value, importance and criticality of external advocacy, the latter of which would benefit from rewarding development and the implementation of such engagements – An outreach advisory committee and events to bridge the gap between secondary and university science.

Finally, the strategic goals of the Faculty can progress through a strong, accountable and agile scientific approach that empowers and values the input of all. Individuals or teams comprised of Faculty, staff and students, in germane areas, can propel initiatives through aggressive plans of action that focus on engagement, collaboration, outreach and mentorship, all for the benefit of a sustainable STEM environment.



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A CMP (Department of Computer Science, Mathematics and Physics) Perspective:

By Dr. Mechelle Gittens – Head, CMP

STEM has burgeoned in very recent history with the explosion of Data Science to understand and provide intelligence from complex data generated in natural and man-made systems. As we look behind us to the last decade, we see the expansion of Robotics and Artificial Intelligence (AI) with the advent of Siri and Alexa, Social Robots, Self-Driving Cars and Robotic Exoskeletons to enhance our efficiency and daily functioning. These AI-based systems have been improving the lives of marginalized groups, such as the disabled, the elderly and those with learning challenges. We have also seen the discovery of gravitational waves and the ability to measure changes in space-time that may have resulted from colliding black holes. From space, we come right back down to earth as our attention turns from galaxies and their dynamics, to climate change and its impacts, and how renewable energy science can change the rising temperatures occurring across the Earth.

As we consider the future and attempt to sketch the direction of these exciting new solutions to the challenges that impact our daily lives, we might find ourselves writing an episode of the next Star Trek™ series, or laying out technology to be used in a Mission Impossible™ movie, a script for the Faculty of Science and Technology at the UWI Cave Hill. However, we are indeed at the crossroads of imagination and reality. Our faculty will turn nuisances into resources, with an example being the use of Sargassum Seaweed as fuel for vehicles. We will see FST contributing to its community, with those with physical limitations utilizing prosthetic aids that are accessible to those with limited funds who have weaknesses or debilitating injury to limbs. We will see endearing robots assisting the elderly as companions in situations where they may be shut-in due to the prevalence of viral illnesses.

On the horizon are smart campuses, towns and centres that utilize sensors in road signs and vehicles to help with traffic or ambulance routing; and medicine vials that track medication to manage compliance and reduce health crises for those with menacing Non-Communicable Diseases (NCDs).

As we look behind and ahead, we recognize the scientific exploration done by the scientists and students in the Department of the Computer Science Mathematics and Physics (CMP) covers many of the needs on the horizon. We also recognize that our curriculums evolve with the experience of the researchers exploring these very relevant problems and bringing them to the classroom.

The CMP Department will also continue to work as part FST to reach the goals of access and education for diverse populations. Our focus is to increase outreach to, enrolment of, and support for, female students, those with disabilities and at-risk youth. Our people are where the future of STEM lies. It is not just about the disciplines, but the disciples.

Many of these under-represented groups have not thrived in the STEM fields because of lack of access to facilities, insufficient role models, the stereotype threat, and hindrances in education. The problems are within our hands to change. FST can help. The world is starting to recognize that STEM diversity leads to increased innovation. We in FST know this. The need to increase human resources is driving initiatives such as Grow with Google®, and efforts at the local level to reduce the disparities between the haves and the have-nots. In CMP, we are crafting a future that integrates collaboration between CMP researchers and industry to mitigate hindrances. We prioritize the movement of research from ideas to innovation, with an intention to move innovation to enterprise. This will help the UWI to bridge a chasm in STEM-based product/service development for Barbados and the Caribbean region. Our FST disciplines are the root of economic diversification and sustainability. We will therefore feed the roots with research, education, and entrepreneurship to see the region grow.

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A CERMES (Centre for Resource Management and Environmental Studies) Perspective:

By Dr. Patrick McConney - Director, CERMES

The Centre for Resource Management and Environmental Studies (CERMES) offers students and postdoctoral researchers an interdisciplinary experience in almost any aspect of natural resource management and environmental studies. This is through learning, research, outreach and consultancies in areas such as coastal and marine resources, freshwater resources, climate and land management. Our tag line is “*Applying Science to Sustainability*”. STEM pervades all of our undertakings, even when combined with social science, law, health or other endeavours.

We see STEM playing a larger role than before in solving problems and creating opportunities in achieving sustainable development goals and objectives. For example, much of what CERMES is engaged in with partners around the globe involves creating and manipulating the conceptual and numerical model in areas as diverse as biodiversity, geoinformatics, fisheries, climate change, water resources, soil dynamics, gender and social networks. For all of these, there is cool open-source software and an increasing number of cloud services that persons with STEM capacities can use to take our resilience thinking and practices to new levels. For example, our cutting-edge work with unmanned aerial systems (i.e., drones) for research on sargassum seaweed benefits from skills in engineering and technology in the field, and cloud-based mathematical and scientific analytics for 3D modelling and interpretation, especially as we craft cost-effective and efficient approaches well suited to small islands with small budgets.

To us, the future of STEM is bright, especially for interdisciplinary work that can make a real difference in human well-being. This is the essence of true innovation and entrepreneurship, whether commercialized or not. Coupled with outreach to the Caribbean community and the strengthening of citizen science, CERMES sees a growing demand for, and use of, STEM in the future.

Our FST Students’ Perspectives:

By Ms. Sanya Compton, PhD Candidate, CERMES and CHAPS FST Representative (2019-2021)

STEM is the future, and the future is now. In a world where knowledge and technology are rapidly evolving, STEM will not only be about mastering what we already know, instead it is a lifelong commitment to learning and adapting to the changing world.

There is a plethora of opportunities in STEM and many of the world’s leading institutions are dedicated to producing the next skilled generation of workers. Practical “learning by doing” approaches are being implemented to foster a deeper understanding of complex STEM disciplines. Sometimes perceived as daunting to many, STEM disciplines are being made easy to understand by merging theoretical concepts with real-world cases/examples.

The Faculty of Science and Technology (FST) at the University of the West Indies (UWI) Cave Hill is on stream with this global movement in STEM. Greater focus has been placed on self-reliance and self-determination with a concentration on funding and leadership. Through its various initiatives (i.e., programmes, courses and partnerships) the FST is strengthening its participation in the economic growth of Barbados and the Caribbean region. The aim is to achieve its long-term goals of the UWI becoming a leading STEM innovation institution.

I am certainly proud to be a part of such a progressive and pioneering Faculty. I look forward to the continued investment and support in STEM students much like myself.



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Our FST Students' Perspectives Continued:

By Mr. Kyle Holder-Leach, Science and Technology Faculty Representative (Undergraduate Students), Guild of Students (2020-2021) & newly elected President – Guild of Students, The UWI – Cave Hill Campus

Science and Technology has formed the pinnacle of our societies in everything we see, hear and do. From something as simple as the sewing machine, to something as critical as a vaccination, they have shown the importance of STEM, and the expertise and knowledge in STEM has been intertwined into the very fabric of societies around the globe.

Despite the above, scientists are often forgotten and unrecognized for their intellectual grandeurs, this time more than any, especially when we see the entire globe rally behind the scientists, doctors and medical practitioners around the world. This state of unison and effervescence, all behind one goal of finding treatments and cures for the COVID-19 virus, should be the permanent state of everyone everywhere, by propelling and pushing the scientific causes of their respective geniuses around the world.

My hope, especially after a time like this, is that we all see the importance of our technocrats and scientists. We will see the vital role these stalwarts will play in our future. I see The UWI and the region moving the FST, and its campuses, towards the true depiction of our "Smart Campus" concept. An advanced Campus, integrated with cutting edge technology and a hot pot of scientific exploration and discovery, that will propel our institution and this region into a new era. An era of technological prosperity that will infiltrate every aspect of our society to better our day-to-day activities and effect real advancements for our region.

I see the Faculty of Science & Technology as much more than a Faculty; I see it as a breeding ground for minds unlike anything our region has seen. Minds that will lead us into a new age of Science, and a new age of Technology.

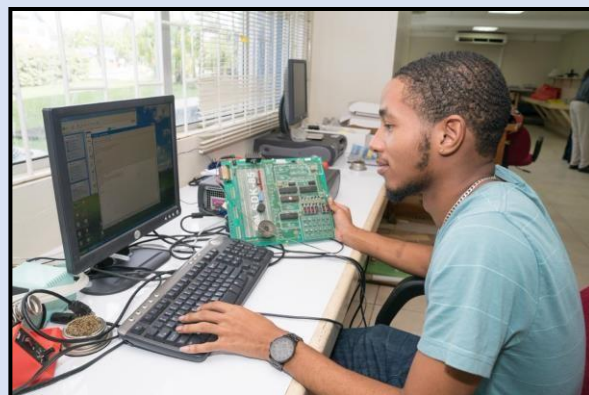
Our FST Students' Perspectives Continued:

By Ms. Chelsea Jordan, the Newly Elected Science and Technology Faculty Representative (Undergraduate Students), Guild of Students (2021-2022)

As the newly elected FST Undergraduate Student Representative, I am very pleased to see the move that the FST has made, and continues to make, in ensuring that our [students] degrees are more holistic, and our time spent at the University is truly beneficial. We, however, can only truly move forward efficiently if all parties are aware of the strides that are being made.

I must admit that the vision of the Faculty is not as wide known as it may have been assumed, and sometimes we as students feel as if enough is not done for us, because we are unaware. Our Faculty has produced, and continues to produce, some of the greatest minds, and because we have the tools and the potential, I can see our Faculty evolving into more than just a teaching space. This vision can only be truly achieved if greater emphasis is placed on adaptability and modifications to teaching and how students learn, so that no one is left behind.

COVID-19 has shown us the disparities that exist, and, for the future, we must be able to work with an ever-evolving world. The meaning behind STEM in itself screams futuristic and inclusivity, and from incorporating mentors and job opportunities for students, and making spaces accessible for everyone, I truly believe that the Science for ALL initiative is a step in the right direction for the Faculty. STEM is the future and we must ensure that we are not left behind.



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Our FST Dean's Perspective:

By Dr. Colin Depradine - Dean

The traditional view of a Science Faculty is one focused solely on the teaching and research of all aspects of STEM. Of course, in this modern world, that view has fundamentally changed, where there is the expectation that a Science Faculty will become a key stakeholder in the economic and social development of Barbados and the Caribbean region. This involves active participation in the entrepreneurial side of STEM from a variety of angles, including:

- a. Using research and expertise to solve local and regional problems that will facilitate social development and increase competitiveness within the private sector;
- b. The commercialization of applied science and technology research through entrepreneurship; and
- c. The development of graduates, who themselves can become entrepreneurs, utilizing their STEM skills.

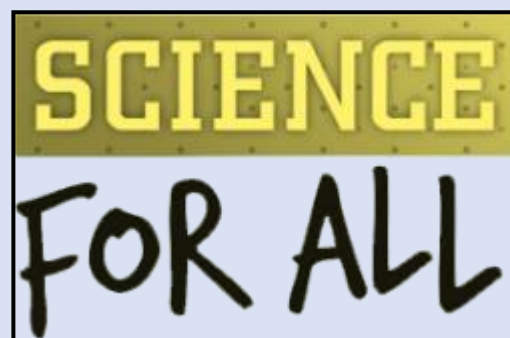
With this in mind, the Faculty has engaged in a number of foundation building initiatives to facilitate the internal transformation needed to meet these new expectations.

The first step was the implementation of the Faculty's Science for ALL initiative. This initiative is an Open Science approach where the primary philosophy is that science is for everyone, including persons with disabilities. STEM cannot grow in the Caribbean unless all barriers to science and technology are removed, allowing innovation to occur anywhere, anytime, and by anyone.

Next was the creation of the entrepreneurship development cycle, which includes the Faculty's Innovation and Entrepreneurship Day, Innovation (FINO) Award and Dean's Council, all with the intent of fostering entrepreneurship within the Faculty and strengthening the relationship with the private sector.

Moving forward, the careful growth of this cycle will facilitate the creation of leaps in innovation that generate employment, advance research and increase competitiveness, moving Barbados and the Caribbean region up the value chain in STEM-related areas. Also, our unique small island state perspective will allow us to become high value niche players in STEM.

In the end, the incorporation of STEM into regional development will only work if we work together. The Faculty, Government, private sector and the general public must collaborate in order to achieve success.



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The Value of Local Innovation in STEM:

By Dr. Colin Depradine - Dean

STEM has become one of the most important factors affecting the development of any country. Governments, industry, education and even the general public are turning to scientists and technologists for solutions to resolve difficult problems. This has become readily apparent during the COVID-19 pandemic where critical scientific research is required to successfully defeat this disease.

Like all other disciplines, scientific research builds on the knowledge developed by previous research. Similarly, STEM-based solutions utilize the ideas and best practices emanating from other solutions. However, one of the common mistakes made is the belief that the utilization of prior knowledge means taking a solution and modifying (or forcing) it to fit and resolve our local problems, resulting in a less than ideal solution. In most cases, what is really needed is the use of best practices and bringing them together to create a unique local solution.

Sometimes the solution is in front of you but biases against local expertise can work against you. For example, storm resistant buildings - a question being explored around the world. However, we have buildings throughout the Caribbean, hundreds of years old that are still standing. What did our ancestors discover that made these buildings so resistant? Many times, it is a subtle, straightforward solution like the use of braces in the roof. However, the temptation to downgrade local solutions results in those from outside the Caribbean region capitalizing on local assets.

Cooperative credit unions and farm cooperatives have demonstrated the power of community throughout the Caribbean region. During the recent COVID-19 lockdowns, a cooperative approach to providing delivery services could have been adopted. Local software developers and mathematicians could have been utilized to create logistical models for the delivery of goods and services via our complex road system, taking into account the high variations with regards to the spread of the population during work hours and at night.

Success in STEM is not just about knowledge and expertise but believing in your people and their ability to solve local problems. Believing that a local solution is as good as any solution from overseas. Accepting that failure is a lesson learned and not an indictment about ability. Keeping this in mind and working together, Barbados can become a full smart island where technology innovation becomes the norm. However, the most important factor is believing in yourself and to not fear thinking way out of the box.



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