



DEPARTMENT OF PHYSICS

Prof. Tannecia Stephenson Head Of Department

BSc, PhD UWI

Overview

The Department of Physics celebrated the achievements of its staff and students in 2021/2022 with one emeritus professor appointment; four postgraduate scholarships; two Vice Chancellors awards, three long service awardees named; two FST Mona Administrative and Technical Staff (MONATS) awards; two Scientific Research Council (SRC) 'Science and Technology Xxtrolineers' awards; one international recognition/honours; 28 undergraduate majors/minor awarded; and, three PhDs, three MPhils and four MScs awarded. The Department presented its action plan and implementation progress at Academic Board on March 17, 2022 in follow up to the Quality Assurance Review facilitated March 8-12, 2021. Two new courses that were commissioned by CARICOM and developed in partnership with the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) were also approved. There were 27 publications and a grantsmanship of ~US\$333,000.

Undergraduate Curriculum and Student Experience

The courses Fundamentals of Energy Statistics (PHYS2000) and Energy Information Management (PHYS3000) were approved by the Academic Quality Assurance Committee (AQAC) on March 14, 2022.

Two Physics Honour Society Events were held during the year to recognize the accomplishments of undergraduate students excelling in Physics. Twenty-four students were invited for membership in Semester 1 and 23 in Semester 2

Award of Degrees

Approximately 28 undergraduate students were awarded majors/minors from the Department and 4 graduated with First Class Honours. There were also 4 M.Sc. (Medical Physics), 3 M.Phil and 3 Ph.D. graduates.

Total Undergraduate Student Registration

Academic Year	Semester 1				Semester 2			
	2020-2021	Female	2021-2022	Female	2020-2021	Female	2021-2022	Female
Preliminary	70	28	64	33	56	22	41	20
Introductory Physics	65	29	61	25	79	35	71	29
Year 2	130	45	110	49	58	18	45	17
Year 3	42	10	37	17	96	38	62	25
Totals	307	112	272	124	289	113	219	91

Undergraduate Students/Recognition Awards

Recipients of undergraduate departmental awards for the Academic Year 2021-2022 are:

• The Professor John Lodenquai Prize for Introductory to Physics	Krystin Henry
• Level II Physics Bursaries	Justin Gooden and Kyra-Akilah Richards
• Michael Tharmanathan Physics Bursary	Shannon France
• Michael Neville McMorris Prize for Physics	Cadane Codner
• Physics Honours Society Award	Wills Small and Theodore Bennett
• Charlton Foundation Award	Deaja Manning

CAPE and High School Outreach

The Annual CAPE Physics Workshop was hosted January 3-6, 2022. Over 30 schools with approximately 414 students participated. A Teacher Training Workshop was also hosted January 4-7, 2022. The Workshop was facilitated by Faculty of Humanities and Education who covered pedagogy and Unit 1 Physics was facilitated by Dr. Venkateswara Penugonda and Unit 2 was facilitated by an alumnus Mr. Phillip Logan. The Workshops were coordinated by Miss Candice Charlton.

The Faculty of Science and Technology and the Department hosted sessions with female high school students on February 10 and 11 in celebration of International Day for Women and Girls in Science. Dr. Tanya Kerr

was a contributor to the Faculty of Science and Technology's "Total You" Career forum on February 24, 2022.

Special Projects and Seminars

The Climate Studies Group Mona in partnership with the UWI's Global Institute of Climate Smart and Resilient Development (GICSRD) issued three press releases in 2021-2022 to highlight key messages for the Caribbean emerging from the publication of the Working Groups I, II and III Contributions to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report.

Dr. Venkateswara Penugonda successfully completed a 2-month research visit (1 July-31 August 2021) to the Akademia Górniczo-Hutnicza (AGH) University Krakow Poland and Trenčianska univerzita Alexandra Dubčeka v Trenčíne for the collaboration on Glass Science research. The visit was enabled by the Slovak Academic Information Agency (SAIA) National Scholarship Programme (NSP) fellowship, Slovakia. Representatives of the Department of Physics participated in the Faculty of Science and Technology (FST) Resource Mobilization Consultation Session and the FST Town Hall hosted on August 25. Ten representatives of the Department of Physics participated in a 2-week Light Detection and Ranging (LiDAR) training hosted by the Caribbean Community Climate Change Centre from August 30 to September 2, 2021. The initiative is funded by the Caribbean Development Bank (CDB).

Professors Michael Taylor and Tannecia Stephenson presented at a lead-up event to the UN Climate Change Conference COP26 titled Towards a Low-Carbon and Climate Resilient Future for Jamaica: Pre-COP 26 Conversations and Launch of Jamaica's NDC's Partnership Plan on Tuesday, September 28, 2021. Prof. Taylor presented on Zero Matters and Prof. Stephenson on Science Matters: Dissecting the IPCC Report. Drs. Louis-Ray Harris, Randy Koon Koon and Prof. Tannecia Stephenson participated in the Caribbean Community (CARICOM)-CCREEE Capacity Building in Energy Balance Methodology October 19 - November 4, 2021. The objective was to train the CARICOM and CCREEE delegates in the Methodology for Energy Balances of OLADE (Organización Latinoamericana de Energía), which is harmonized with the IRES (Industrial Renewable Energy Solutions) methodology. Professors Michael Taylor and Tannecia Stephenson attended the

signing of a Memorandum of Understanding between The University of the West Indies and the Norway's University of Bergen (UiB) to advance research and action on the United Nation's Sustainable Development Goals 13 (Climate action) and 14 (Life Below Water). The signing was hosted aboard the training vessel Statsraad Lehmkuhl while anchored at the Port Royal Cruise Ship Terminal on November 13, 2021. The Mona Fire Research Group collaborated with Jamaica Fire Brigade to host and deliver a seminar entitled "Fire safety and prevention in laboratories" on December 3, 2021. A presentation was made supported by videos highlighting the areas discussed.

A 3-day workshop on Building Climate Resilience in the Agricultural Sector – Emerging Applications in Climate Smart Agriculture was facilitated January 11-13, 2022 by The Climate Studies Group Mona under the Pilot Programme for Climate Resilience (PPCR) funded by the Inter-American Development Bank through Climate Investment Funds and in partnership with the Caribbean Agricultural Research and Development Institute (CARDI) and the CCRIF SPC. There were approximately 350 participants. Dr. Dale Rankine coordinated the effort. On February 22, a Launch of 'Climate Change Products for Education' was hosted at the Jamaica Pegasus Hotel. The climate change products include a book "Let's make a difference: A Caribbean Primer on Climate Change for Primary Schools"; a Braille version of the 'State of the Jamaica Climate for Policymakers' and a Youtube Channel with videos on the climate change. The initiative was supported by the United Nations Development Programme (UNDP) Global Environment Facility Small Grants Programme (GEF SGP) and the Planning Institute of Jamaica (PIOJ). The activities were enabled under the project Resilience Strengthening to Climate Change Impacts through Youth Education in Primary Schools and coordinated by Dr. Dale Rankine.

The University of the West Indies (Mona, Cave Hill and St. Augustine) and the University of Miami hosted a seminar presentation by Prof. Massimiliano Galeazzi, Chair of Physics and Cooper Fellow on Probing the X-Ray Sky with Sounding Rockets: The University of Miami DXL Mission on March 17, 2022. The Department in partnership with the Meteorological Service Jamaica facilitated the Launch of "Jamaica's Bush Fire Warning Index" at The UWI Undercroft on March 23, 2022- World Meteorological Day. The index forecasts the potential or risk of fire outbreaks in Jamaica in an attempt to mitigate the negative impacts associated with these events. The keynote address was given by the Hon. Matthew Samuda, Minister without Portfolio.

lio in the Ministry of Economic Growth and Job Creation. Other partners include the Jamaica Fire Brigade, the Forestry Department, the National Environment and Planning Agency, the Office of Disaster Preparedness and Emergency Management and the Rural Agricultural Development Authority. The Department of Physics in partnership with the University of Dayton hosted an online seminar on Graduate Research Opportunities at the University of Daytona on March 31, 2022. The main presenter was Prof. Jay Matthews, Associate Professor in the Department of Physics at the University of Dayton. Forty-two staff and students participated in the session. Drs. Sharon Bramwell-Lalor, Therese Ferguson and Mr. Miguel Ison from the UWI Mona School of Education (SOE) conducted a blended workshop on "Climate Change for Primary Schools: Enhancing Teachers' Preparedness to Deliver". A presentation was done on July 13 and 15, 2022 to primary and secondary school teachers in the NEET Summer CAMP coordinated by Dr. Marvadeen Singh-Wilmot from the Faculty of Science and Technology. The participants were engaged in activities geared primarily to introduce them to the Climate Change textbook, teacher's manual and animated videos created by the SOE team in collaboration with the Climate Studies Group Mona.

Dr. Leonardo Clarke made a poster presentation at the Gordon Research Conference (GRC) Climate Engineering Conference on "Processes and Impacts of Radiation Management Approaches to Climate Change" in Newry, Maine USA from June 26 to July 1, 2022 and also attended a research residency at Harvard University in Cambridge, Massachusetts USA from July 1 to 9, 2022.

Other Strategic Partnerships

The Department of Physics, The UWI Mona, through the initiative of Dr. Phylicia Ricketts, is now a partner in the United Nations Environment Programme (UNEP) Global mercury partnership. Dr. Phylicia Ricketts joined the Caribbean Regional Mercury Monitoring Network (CRMMN) on November 3, 2021.

Prof. Michael Taylor, Dean of the Faculty of Science and Technology and co-Director of the Climate Studies Group Mona is one of 100 global contributors to Greta Thunberg's soon to be published Climate Book. Professor Taylor was invited to submit a contribution on sea level rise and small islands.

Staff Recognition and Student Awards

Mr. Deron Maitland is one of two UWI students who participated in The One Ocean expedition that commenced September 2021. The expedition enabled researchers and scientists to take oceanographic and meteorological measurements as well as other valuable research samples on the open ocean.

Four Physics postgraduate students were recipients of The UWI Postgraduate Scholarship Awards. They are Santana Lewis, Lanceford Sterling, Stefan Watson and Dudley Williams.

Mr. Lanceford Sterling emerged as a finalist in The UWI's 3-minute thesis competition.

Professor Michael Taylor was named among Apolitical's 100 Most Influential Academics in Government for his contribution to climate and sustainability policies.

Dr. Venkateswara Rao Penogonda was the recipient of The UWI Vice Chancellor's Awards for excellence in teaching.

Professor Tannecia Stephenson was recognized as a recipient of The UWI Vice Chancellor's Awards for excellence in research accomplishments.

Professor Mitko Voutchkov was conferred the title "Emeritus". Professor Emeritus Voutchkov retired in 2005. He served at The UWI's International Centre for Environment and Nuclear Science (ICENS) from 1993 to 2006, and then at the Mona Campus Department of Physics from 2006, until his retirement. He is currently a Consultant at the University Hospital of the West Indies (The UHWI) in Nuclear Medicine and Radiation Safety.

Miss Margaret Little received the award for the Administrative Staff Category (MONATS).

Mr. Andre Gordon was recognized for Excellence in the performance of Technical Duties (MONATS).

Dr. Leonardo Clarke, Mr. Jeremy Lothian and Prof. Tannecia Stephenson were named recipients at the UWI's Long Service Awards for 15 years of continuous service to the University.

Professor Tannecia Stephenson and Dr. Phylicia Ricketts were two of the recipients of the Scientific Research Council (SRC) Science & Technology, Xxtrodineers, Jamaica awards for significant scientific achievement. The ceremony was held on July 14, 2022.

Staff Welfare and Development

A voluntary Physics Savings Club for Administrative, Technical and Service (ATS) Staff was launched in 2021 to complement the long-term savings of staff members. Technical and Service Staff Appreciation Day, Administrative Professionals; Day and Teachers' Day were among the days celebrated. The Birthday Club celebrations are also ongoing. Seven staff members also participated in the CB Group UWI 5K and Smart Eggs Kids K Run on November 12, 2021.

Staff Changes

Professor Tannecia Stephenson completed her tenure as Head of Department on July 31, 2022. Dr. Venkateswara Penugonda was appointed for a three-year term commencing August 1, 2022.

Ms. Sherica Hall, Senior Instrument Technologist resigned from her position in July 2022 to undertake further studies. Ms. Alexandra De Freitas commence duties in this position on August 1, 2022.

Mr. Tajay Edwards accepted a one year internship offer from The Caribbean Institute for Meteorology and Hydrology (CIMH) in Barbados. Mr. Rickardo Anderson commenced duties in this position on August 31, 2022.

Miss Rochelle Morgan resigned from her position as Laboratory Technologist.

Infrastructure and Information Technology Upgrades

The Department's Labour Day initiatives were executed on May 20, 2022. Our activities included: painting the patio and gardening the area adjacent to the Medical Physics Laboratory. The Department received 10 desktop computers from project initiatives. A 3-D Printer and two thermal cameras have also been acquired through project initiatives.

Internship

The Climate Studies Group Mona (CSGM) hosted Miss Soyini Elliott for a 10-week CCRIF internship. Miss Elliott investigated the impact of climate change on the Fisheries Sector of Jamaica. Her internship was supervised by Prof. Tannecia Stephenson and Dr. Jayaka Campbell.

Dr Jayaka Campbell hosted 2 final year students, Matthew Davis and Kamoi Gilkes, in a Physics Department internship programme. The students analyzed climate model projections using python and other computational physics tools.

Passing

The Department of Physics notes with sadness the passing of Mr. Rudolph Blair, former member of staff in the Department of Physics who passed on January 22, 2022. Mr. Blair served as a Senior Instrument Technologist for a number of years. In 2002 he was the recipient of a UWI long service award for 21 years and gave service up to (about) 2014.

Publications

Articles

- Yachao Wang, Jie Chen, Yu Jiang, Marhoun Ferhat, Saneyuki Ohno, Zuhair A. Munir, Wenhao Fan*, and Shaoping Chen "Suppression of Interfacial Diffusion in Mg₃Sb₂ Thermoelectric Materials through an Mg_{4.3}Sb₃Ni/Mg_{3.2}Sb₂Y_{0.05}/Mg_{4.3}Sb₃Ni-Graded Structure" ACS Appl. Mater. Interfaces 2022, <https://doi.org/10.1021/acsami.2c09477>, IF 14.4
- A. Asirvadam, Valluri Ravi Kumar, M. Nagarjuna, G. Naga Raju, P. Syam Prasad, G. Sahaya Baskaran, V. Ravi Kumar, P. Venkateswara Rao. "Optical and Luminescence properties of Er³⁺ doped Sb₂O₃-Li₂O-MO (M=Mg, Ca and Sr) glasses" . Optical Materials 128 (2022) 112422, 1-9, ISSN: 0925-3467. IF 3.08
- A. Asirvadam, Valluri Ravi Kumar, B. Naveen kumar Reddy, G. Naga Raju, P. Syam Prasad, P. Venkateswara Rao "Spectroscopic properties of Nd³⁺ ions in Li₂O-MO (M=Mg, Ca and Sr)- Sb₂O₃ glasses" Optik – Accepted. International Journal for Light and Electron Optics 264 (2022) 169405, 1-12, ISSN: 0030-4026. IF 2.443
- Yu Jiang, Marhoun Ferhat, Wenhao Fan, Shaoping Chen, Yachao Wang, Jie Chen, Rasha Abdullah Ahmed Al-Yusufi, Chaochao Dun "Thermoelectric Enhancement Achieved by Y and La Co-doping in n-Type

Mg₃2Sb1.5Bi0.5" Chemical Engineering Journal, (2022),136981,ISSN 1385-8947, <https://doi.org/10.1016/j.cej.2022.136981>. IF 13.273

- M. Mohan Babu, P. Venkateswara Rao, Rajendra K. Singh Hae-Won Kim, N. Veeraiah, Mutlu Ozcan, P. Syam Prasad. "ZnO incorporated high phosphate bioactive glasses for guided bone regeneration implants: enhancement of in vitro bioactivity and antibacterial activity" Journal of Materials Research and Technology 2021; 1 5:633-646 IF 5.039
- D. Rankine, J. Cohen, F. Murray, P. Moreno-Cadena, G. Hoogenboom, J. Campbell, M. Taylor and T. Stephenson (2021). Evaluation of DS-SAT-MANIHOT-Cassava Model for potential irrigation benefits for cassava in Jamaica. Agronomy Journal. 113(6). 5317-5334. IF2.24
- Mandal A, T. Stephenson, J. Campbell, M. Taylor, S. Watson, L. Clarke, D. Smith, J. Darsan, and M. Wilson 2022: An assessment of the impact of 1.5 versus 2 and 2.5°C global temperature increase on flooding in Jamaica: a case study from the Hope watershed. Phil. Trans. R. Soc. A 380: 20210141. <https://doi.org/10.1098/rsta.2021.0141> IF 4.226
- Francis S, Frank C, Buchanan L, Green S, Stennett Brown R, Gordon Strachan G, Rubio Palis Y, Grant C, Lindo R, Nwokocha C, Robinson D, Delgoda R. (2021): Challenges in the control of neglected insect vector diseases of human importance in the Anglo-Caribbean. One Health Journal <https://doi.org/10.1016/j.onehlt.2021.100316> IF 3.569
- Koon Koon, R., Lewis, S., Mohammed-Koon Koon, K., Chen, A. A., and Shah, K. (2022): A Monte Carlo based approach to the resource assessment of Jamaica's geothermal energy potential. Phil. Trans. R. Soc. A. 380:20210133. <https://doi.org/10.1098/rsta.2021.0133>. IF 4.226
- Walker, D.C., J.M.R. Antoine, J.A. Williams, C.N. Grant, and M.K. Voutchkov, (2021): Elemental investigation of renal calculi in Jamaica by instrumental neutron activation analysis (INAA). Journal of Radioanalytical and Nuclear Chemistry. DOI: 10.1007/s10967-021-08071-6 IF 1.373
- Chen. Shaoping, Chen. Jie, Fan. Wenhao, Wang. Yaning, Guo. Jingyun, Wang. Yachao, Jiang. Yu, Al-Yusufi. Rasha Abdullah Ahmed and Ferhat, Marhoun (2022): "Improvement of Contact and Bonding Performance of Mg₂Si/Mg₂SiNi₃ Thermoelectric Joints by Optimizing the Concentration Gradient of Mg", Journal of Electronic Materials. <https://doi.org/10.1007/s11664-022-09477-y>, IF 1.938
- Catlow CRA, L. Henry, C. Ngila, and M. Taylor (2022): Preface to 'Developing resilient energy systems'. Phil. Trans. R. Soc. A 380: 20210131. <https://doi.org/10.1098/rsta.2021.0131> IF 4.226
- Ricketts P., M. Voutchkov and A. Gordon (2022): "Characterization of inorganic elements in common consumer plastics using handheld Xray

fluorescence analyser". Environmental Science and Pollution Research. IF 4.22

- .K. Stephenson, B. Wilson, M. Taylor, K. McLaren, R. van Veen, J. Kunna and J. Campbell (2022): Modelling Climate Change Impacts on Tropical Dry Forest Fauna. Sustainability, 14, 4760. <https://doi.org/10.3390/su14084760> . IF 3.251
- Y. Jiang, M. Ferhat, W. Fan, S. Chen, Y. Wang, J. Chen, R. Abdullah Ahmed Al-Yusufi, C. Dun (2022): Thermoelectric Enhancement Achieved by Y and La Co-doping in n-Type $\text{Mg}_{3.2}\text{Sb}_{1.5}\text{Bi}_{0.5}$ Chemical Engineering Journal, <https://doi.org/10.1016/j.cej.2022.136981> IF 13.273
- G. Devarajulu , G. Lakshminarayana, P. Venkateswara Rao , Dong-Eun Lee , Jonghun Yoon , Taejoon Park "Er³⁺-doped SiO₂-based glasses – An exploration of structural, visible, chromatic, and NIR fluorescence characteristics". Accepted to Journal: Materials Research Bulletin. IF: 4.641 <https://doi.org/10.1016/j.materresbull.2021.111634> IF 4.641
- B. Madhavi, A. Siva Sesha Reddy , P. Syam Prasad , Prakash Saudagar , P. Venkateswara Rao, V. Ravi Kumar , N. Veeraiah. Influence of SeO₂ on in vitro bioactivity and antibacterial activity of CaF₂-CaO-B₂O₃-P₂O₅-SrO glass system. Journal: Materials Chemistry and Physics. <https://doi.org/10.1016/j.matchemphys.2021.125653>, IF: 4.094

Book

- Bramwell-Lalor, S., T. Ferguson, M. Ison, The School of Education and the Climate Studies Group, Mona (2022). Let's Make a Difference: A Caribbean Primer on Climate Change. ISBN 978-976-96850-0-0 (paper-back). ISBN 978-976-96850-1-7 (eBook).

Journal

- CRA Catlow, L Henry, C Ngila and M Taylor (Eds.) 2022: Developing Resilient Energy Systems. [Special Issue]. .Phil. Trans. R. Soc. A. Volume 80.

Monographs

- PCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson[1]Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S.

Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press. In Press. T. S. Stephenson. Lead Author

- Doblas-Reyes, F. J., A. A. Sörensson, M. Almazroui, A. Dosio, W. J. Gutowski, R. Haarsma, R. Hamdi, B. Hewitson, W-T. Kwon, B. L. Lamptey, D. Maraun, T. S. Stephenson, I. Takayabu, L. Terray, A. Turner, Z. Zuo, 2021, Linking Global to Regional Climate Change. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press. In Press.
- Ranasinghe, R., A. C. Ruane, R. Vautard, N. Arnell, E. Coppola, F. A. Cruz, S. Dessai, A. S. Islam, M. Rahimi, D. Ruiz Carrascal, J. Sillmann, M. B. Sylla, C. Tebaldi, W. Wang, R. Zaaboul, 2021, Climate Change Information for Regional Impact and for Risk Assessment. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press. In Press. T. S. Stephenson. Contributing Author
- Gutiérrez, J. M., R. G. Jones, G. T. Narisma, L. M. Alves, M. Amjad, I. V. Gorodetskaya, M. Grose, N. A. B. Klutse, S. Krakovska, J. Li, D. Martínez-Castro, L. O. Mearns, S. H. Mernild, T. Ngo-Duc, B. van den Hurk, J-H. Yoon, 2021, Atlas. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press. In Press. [Atlas]. T. S. Stephenson - Contributing Author

- Henry, L.; McKenzie, B.; Goodridge, A.; Pivott, K.; Austin, J.; Lynch, K.; Spencer, S.; Cox, F.; Holder, N.; Murray, R.; Prado, V.R.; Ravillard, P. (2021). Experimental evidence on the use of biomethane from rum distillery waste and Sargassum seaweed as an alternative fuel for transportation in Barbados. (IDB Technical Note ; 2183). Inter-American Development Bank: Washington, D.C.40 p
- The Jamaica Education Transformation Commission (2022). The reform of education in Jamaica, 2021 - REPORT. Prof. Michael Taylor, Chair.

Non-Refereed Article

- Luke, S., Taylor, M., Smith, D., Reynolds, R., & Shuckburgh, E. (2021). COP26 Futures We Want - Jamaica Country Profile. Cambridge Open Engage. doi:10.33774/coe-2021-q8s0k-v2 <https://www.cambridge.org/engage/coe/article-details/61798b326c5aa07bd726a76d>

Other Publication

- Taylor, Michael (2022) 'Tackling Flooding – we cannot keep doing things the same way', The Jamaica Gleaner, 13 February.
<https://jamaica-gleaner.com/article/commentary/20220213/michael-taylor-tackling-flooding-we-cannot-keep-doing-things-same-way>

Conference Abstracts

- Craig Rattray, Kert Edward and Marhoun Ferhat "Development of a Simple Automated Image-based Sun Position Tracking Algorithm" The Frontiers of Research in Caribbean Science and Technology (FORECAST) Conference 2022: "Science & Technology: a D.R.I.V.E.R. of transformation". Kingston, Jamaica, August 2022
- Dudley Williams, Theodore Wynter, Jayaka Campbell, Tannecia Stephenson, Marhoun Ferhat "nearing a tipping point: heat-stress and small scale poultry farming in Jamaica" The Frontiers of Research in Caribbean Science and Technology (FORECAST) Conference 2022: "Science & Technology: a D.R.I.V.E.R. of transformation". Kingston, Jamaica, August 2022
- Mr. Andre McGlashan, Dr. Venkateswara Penugonda, Dr. Peter Nelson "Physical, thermal, optical, shielding and elastic moduli parameters of Bi2O3-B2O3-TeO2 glass system doped with Fe2O3" The Frontiers of Re-

search in Caribbean Science and Technology (FORECAST) Conference 2022: "Science & Technology: a D.R.I.V.E.R. of transformation". Kingston, Jamaica, August 2022

PUBLIC SERVICE

Dr. Andre Coy

- Convener, Physics Panel for Caribbean Examination Council; Reviewer Journals, IEEE Transactions on Audio, Speech and Language Processing, Computer Speech and Language, Instrumentation Science & Technology; Member IEEE Signal Processing Society; Member IEEE Communications Society; Member STEM Integration Committee - Ministry of Education; Advisor to the Ministry of Education – Core Curriculum Unit.

Dr. Victor Douse

- Chairman, Cement Technical Committee, Bureau of Standards; Technical Assessor, Jamaica National Agency for Accreditation (JANAAC); Chairman, Aggregates Technical Committee; Vice Chairman, Building and Associated Materials Committee.

Dr. Marhoun Ferhat

- Member of the Jamaica Energy Council (JEC) and UWI mona representative.

Dr. Louis-Ray Harris

- Board of Directors for the Spectrum Management Authority Limited

Dr. Tanya Kerr

- Member of the International Association of Fire Safety Science (IAFSS)

Dr. Leary Myers

- Member of Hazardous Substances Regulatory Authority

Dr. Venkateswara Penugonda

- Editorial Board Member for the Journal of Engineering Publication House; Life member in Luminescence Society of India (LSI); Editorial Board Member for the SCIREA Journal of Materials; Member in Caribbean Academy of Sciences, Jamaica (CASJ); Reviewer Journals: 1. Ap-

plied Physics A, 2. Spectroscopy Letters, 3. Materials Science- Poland, 4. Journal of Alloys and Compounds, 5. Journal of Molecular Liquids, 6. Journal of Radiation Research & Applied Sciences, 7. Ionics, 8. Journal of Non-Crystalline Solids, 9. Journal of Physics & Chemistry of Solids, 10. Radiation Physics and Chemistry, 11. Optical Materials, 12. Journal of Industrial Textiles, 13. Journal of Results in Physics

Professor Tannecia Stephenson

- Member, WCRP Climate and Ocean – Variability, Predictability and Change (CLIVAR) Atlantic Region Panel, 2021-2023; Point of Contact for CORDEX – Central America; Member, Steering Committee, Pilot Programme for Climate Resilience.

Professor Michael Taylor

- Member, Board, International Centre for Environmental and Nuclear Science (ICENS); Member, Board, Scientific Research Council (SRC); Member, Jamaica, National Educational Transformation Commission; Representative for Jamaica to the Inter American Institute for Global Change; Member, Climate Change Advisory Board, Ministry of Economic Growth and Job Creation. Member, Steering Committee, Pilot Programme for Climate Resilience (Caribbean); Reviewer Journals: Journal of Geophysical Research, International Journal of Climatology, Journal of Climate, Climate Dynamics, Theoretical and Applied Climatology, Tellus A. Member, Jamaica's High-Level Education Transformation Commission.

Grants and Consultancies

Developing capacity in energy statistics and energy information management. GIZ Technical Assistance Programme for Sustainable Energy in the Caribbean. Euro 54,507.50. Lead T. S. Stephenson

Resilience strengthening to climate change impacts through youth education in primary schools NCB Foundation (co-financing). JM\$90,000. Lead D. Rankine.

Project Affiliation

A Jamaican Path from Hills to Oceans Project: Technical Assistance for a Rapid ecological assessment of the Wagwater, Rio Nuevo and Rio Bueno/ White River Watershed Management Units, Jamaica. PIOJ. US\$280,000. T. S. Stephenson Climate Change Expert.

Research and Publications Grants

Dr. Tanya Kerr was approved for a grant for US \$3000 from the Graduate Studies Research & Publication Fund to purchase equipment/supplies for a project entitled: "Development of Long-Distance Raman Spectroscopy for Detention and Analysis in Potentially Dangerous Environments".

Ms. Santana Lewis was approved for a grant for US \$1,990 from the Graduate Studies and Research Postgraduate Research Fund for purchase of equipment/supplies for project entitled: "A feasibility Study into the Application and Implementation of Geothermal Cooling Systems within the Hotel Chain Industry of Jamaica".

Mrs. Khatiza Mohammed-Koon Koon was approved for a grant for US \$1,391.50 from the Research and Publications Postgraduate Research Fund to cover the cost for a two-day instructor led ArcGIS Software.

Mr. Deron Maitland was approved for a grant for US\$1,947 from the Graduate Studies and Research Postgraduate Research Fund to cover the cost to participate in the ACDC/CHESS One Ocean Field Course 2021 between November 6 to December 3, 2021.