

## DEPARTMENT OF CHEMISTRY

**Professor Helen Jacobs, BSc, PhD, UWI – Head of Department**

### OVERVIEW

In academic year 2011-12 there were 62 students graduating with BSc degrees in Chemistry, four with first class honours and 13 with upper second class honours and five students graduated with higher degrees. Faculty members published a total of 19 journal articles, gave 17 conference presentations and continued to make significant and varied contributions to the profile and impact of the University through outreach and professional service.



Against this backdrop of our routine teaching, research and service functions the department mounted a vigorous programme of conferences, quality assurance and new outreach activities and of curriculum development and renewal. We embraced the concept of the International Year of Chemistry, IYC2011, declared by the International Union of Pure and Applied Chemistry, and made an admirable effort to achieve the goals of IYC2011 through four activities targeted to primary and high school pupils and the general public. The 24<sup>th</sup> Biennial Mona Symposium on Natural Products and Medicinal Chemistry was held in January; the symposium is always an academically stimulating and enjoyable event for staff and research students. In March we were subjected to the rigors of a Quality Assurance Review, and we look forward to the improvements resulting from implementing the recommendations from the review. In this past year too, development of the curriculum for the MSc in Food and Agro-Processing Technology was completed and the programme was approved and arrangements for implementing the revised undergraduate courses and programmes were finalized.

## HIGHLIGHTS OF MAJOR ACTIVITIES

### INTERNATIONAL YEAR OF CHEMISTRY (IYC) 2011

The year 2011 was declared the International year of Chemistry by the UNESCO and the International Union of Pure and Applied Chemistry (IUPAC). Research Day, January 27-28 was used as a soft launch of IYC 2011. Ms. Simone Williams coordinated the activities of the department in celebrating IYC2011. The following activities were completed between November and December 2011.

- The global water experiment for grade 4 pupils in 42 primary schools islandwide (in collaboration with the Ministry of Education)
- A supplement in the Sunday Gleaner, 13<sup>th</sup> November 2011
- A problem-solving competition for grade 11 high school pupils on 24<sup>th</sup> November 2011. Fourteen schools from across the island participated in this competition. The competition was designed to improve competence in and appreciation of the use of the mole concept in an atmosphere of fun. The winners were Immaculate Conception High School (1<sup>st</sup>), St. George's College (2<sup>nd</sup>) and Meadowbrook High School (3<sup>rd</sup>). The Petroleum Corporation of Jamaica (PCJ) sponsored this event.
- Closing ceremony and presentation *Kitchen Chemistry: the Sensational Science of Cuisine*. Associate Professor of Chemistry at New York University. Kent Kirshenbaum gave a very engaging presentation on "Kitchen Chemistry: The Sensational Science of Cuisine" on Saturday December 17, 2011 at the Closing Ceremony of IYC2011 (Jamaica) in C5. The audience, comprised of food enthusiasts, chemists, members of the Campus community and members of the public were exposed to the possibilities of food innovation when science and cuisine are combined. Cocktails followed. Professor Kirshenbaum is co-founder of the Experimental Cuisine Collective and had done presentations in Australia and New Zealand as part of his IYC2011 tour.

## **MONA SYMPOSIUM**

The 24<sup>th</sup> Mona Symposium on Natural Products and Medicinal Chemistry was held in the department, 2<sup>nd</sup> to 6<sup>th</sup> January 2012. The programme included eight plenary lectures delivered by distinguished chemists from Japan (2), the UK (2), USA (3) and Canada (1). Of the 15 short papers, three were given by Mona staff, one by a colleague from Barbados, two by graduate students from Mona, one by a graduate student from St. Augustine and eight by visiting participants from the USA, UK and Canada. There were 45 visiting participants, inclusive of plenary speakers and colleagues and students from the Cave Hill and St. Augustine campuses.

## **QUALITY ASSURANCE REVIEW OF THE DEPARTMENT**

The department was subject to a Quality Assurance Review during the week of 19<sup>th</sup> -23<sup>rd</sup> March 2012. The review team was comprised of Prof. Graham B. Jones, Chair, Department of Chemistry & Chemical Biology, Northeastern University (team leader), Prof. Anderson Maxwell, Department of Chemistry, UWI, St. Augustine, and Ms. Denise Forrest, Environmental Consultant, Forrest & Associates.

## **NEW MASTER'S PROGRAMME APPROVED**

The programme leading to the MSc in Food and Agro-Processing Technology (FAPT) received final approval from the Graduate School in late March. The programme was been advertised and the first cohort is to be admitted in September 2012. **Dr. Ian Thompson** coordinated the academic, administrative and physical arrangements for startup of the programme.

## **BETTER PROCESS CONTROL SCHOOL**

The FDA-approved certification course “Better Process Control School” (BPCS) was delivered in the Department twice this year, 9<sup>th</sup> -13<sup>th</sup> January and 16<sup>th</sup> - 20<sup>th</sup> July, to members of the food industry and regulatory agencies locally and in the wider Caribbean. This course is a requirement for processors of low acid and acidified canned foods, especially if these

products are to be exported to the US. The UWI, Mona BPCS, which is normally run biennially in odd-numbered years and coordinated by **Dr. Donna Minott-Kates**, is self-sustaining and is the only BPCS routinely operated by a non-American institution. These January and July 2012 BPC Schools were the tenth and eleventh schools delivered at UWI, Mona, and were held off-cycle due to the need for processors to meet the requirements of the new Food Safety Modernization Act in the US.

### **WORKSHOP ON NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY**

A two-day workshop entitled *Modern NMR Methods for Structure Determination* was delivered 9<sup>th</sup> -10<sup>th</sup> January 2012 by Emeritus Professor and eminent NMR spectroscopist William F. Reynolds of the University of Toronto. There were 28 registrants consisting of graduate students from St. Augustine (6) and Mona (14) and staff (3 members from St. Augustine and 5 members from Mona). The workshop was funded in part by the Office of Graduate Studies and Research, Mona.

### **WELCOME RECEPTIONS FOR ADVANCED CHEMISTRY STUDENTS**

At the start of each semester this year the department mounted an interactive afternoon programme of informational and motivational presentations for Level II and Level III chemistry students followed by a social. The aim of these sessions is to get these students to engage with and excel in their academic programmes and to graduate in minimum time. Students were also assigned academic advisors from among the Chemistry faculty. Key organizers were **Drs. Michael Coley, Paul Maragh, Novelette Sadler-McKnight, Marvadeen Singh-Wilmot, Mrs. Mitzie Samuels, Mrs. Tracia Johnson-Blair** and the **ChemSoc executive** who co-hosted the events.

## **THE OCCUPATIONAL AND ENVIRONMENTAL SAFETY AND HEALTH (OESH) PROGRAMME**

There were thirty-three students in the MSc OESH programme in Sept 2011, and of these twenty-one were new students. Fifteen students graduated from the programme in November 2011. At the BSc level eight students were registered in advanced OESH courses. The following four short courses were run:

- Essentials of Occupational Safety and Health (EOSH), 30 hours, four cohorts
- Introduction to Indoor Air Quality Assessment
- Use and Application of Industrial Hygiene Toolkits
- Confined Space Entry Programs

## **NEPA VISIBLE EMISSIONS TRAINING**

The Department hosted two Visible Emissions training courses (Smoke Schools) put on by NEPA January 24<sup>th</sup> and July 26<sup>th</sup> 2012. Approximately sixty (60) persons participated in the courses.

## **STAFF MOVEMENTS**

**Mrs. Miriam Lindo**, our Administrator, transferred to the Faculty Office in May 2011 to take up the position of Administrative Officer. **Mrs. Tracia Johnson-Blair**, formerly Senior Secretary, is now the department's Senior Administrative Assistant.

**Dr. Anthony Greenaway** and **Dr. Roy Porter** were on sabbatical leave for the academic year 2011-2012; they were replaced by **Dr. Jillian Roberts** (from Trinidad) and **Dr. Petrea Facey** respectively. **Dr. Ainka Brown** joined the academic staff as a Teaching Assistant. **Dr. Henry Ellis**, formerly Senior Lecturer in Physical Chemistry, was elevated to the rank of Professor in October 2011.

## **OUTREACH ACTIVITIES**

### **CAPE Workshop**

The annual workshop on spectroscopy and chromatography for students sitting the Caribbean Advanced Proficiency Examinations (CAPE) in Chemistry was held between January 16 and 20. A total of 888 students and 46 teachers from 40 secondary institutions across the island participated. As in previous years, this workshop was coordinated by Dr. Novelette Sadler-McKnight.

### **Denbigh Agricultural Show**

The following were highlighted in Department's contribution to the UWI presentation in August 2011 at Denbigh under the theme "Enhancing Jamaican Agricultural Products: Flora, Fauna, Technology and Policy Research".

- Cassava-wheat composite bread project – description, samples, giveaway questions
- Jams from Jamaican berries – sample
- The proposed MSc programme in Food and Agro-Processing Technologies

The exhibit also included a number of chemistry experiments.

## **STUDENT ENROLMENT**

The highest registration for Introductory Chemistry (CHEM1901/1902), 597 students, was recorded this year. This necessitated the establishment of Overflow Lab streams on Tuesday, Wednesday and Friday. The space in the south wing formerly used for Environmental Chemistry research was refurbished to accommodate this overflow to a maximum of ten students.

**Table 1: Numbers of students reading courses in chemistry, 2008-2011**

Level	2008-2009 Sem 1/Sem 2	2009-2010 Sem 1/Sem 2	2010-2011 Sem 1/Sem 2	2011-2012 Sem 1/Sem 2
Preliminary	205/180	129/128	134/116	240/219
Introductory	490/440	532/465	537/458	597/525
Advanced	230/204	271/249	288/268	266/258
Postgraduates	59 (31 F/T; 28 P/T)	45 (24 F/T; 21 P/T)	50 (32 F/T; 18 P/T)	45 (30 F/T; 15 P/T)

## BOOK LOAN SCHEME

The Department continues to operate its book loan scheme for undergraduate students. Demand for textbooks for the introductory courses is still highest, followed by those for the preliminary courses.

## FACULTY AWARDS

**Drs. Michael Coley, Mark Lawrence, Willard Pinnock and Marvadeen Singh-Wilmot** were recognized for outstanding teaching assessments at the Faculty Awards Ceremony. The paper “Tracking Hypoglycins A and B over Different Maturity Stages: Implications for Detoxification of Ackee (*Bligbia sapida* K.D. Koenig) Fruits”. **Camille S. Bowen-Forbes and Donna A. Minott.** *Journal of Agricultural and Food Chemistry* 2011, 59, 3869-3875, was selected as one of the three best publications from the FPAS in 2010-2011, and the authors received one of the Principal’s Research Awards in this category for Research Day 2012.

## DEPARMENTAL AWARDS AND PRIZES

Eight undergraduate students received awards, ranging from \$15,000 to \$60,000, for their academic performance in Chemistry. They are **Keisean Stevenson** (Cedric Hassall), **Davalene Neale** (Garfield Sadler), **Covel McDermot** (Wilfred Chan), **Kristen Morgan** (Leonard J. Haynes), **Alrick Grandison** (Chemistry Department), **Avalon Gilpin** (Pavelich/Honkan) and **Doleasha Davis** (Bertram Fraser-Reid), and the newly created Willard Pinnock Prize was awarded to **Jason Edwards**.

## POSTGRADUATES

Four students completed and were awarded MPhil degrees and one student an MSc. Names of the students who completed higher degrees in Chemistry in 2010-2011, and those of their supervisors are listed in the following table.

**Table 2: Higher degrees in chemistry awarded in 2012**

Degree completed	Name	Supervisor
PhD	Charah Watson	Dr. T. Yee (Natural Products Institute)
MPhil	Safiyah Dundee Sophia Haley	Dr. D. Minott-Kates Prof. T. Dasgupta Dr. P. Maragh
	Sharon Hooper	Dr. J. Jackson Prof. H. Jacobs
MSc (Food Science & Technology)	O'Neil Falloon	Dr. D. Minott-Kates (co- supervisor with Dr. G. Baccus-Taylor, UWI, St. Augustine)

**Ms. Charah Watson**, a PhD candidate in the Department of Chemistry was awarded a grant to attend and make a presentation at the Natural Products, Medicinal, and Organic Synthesis Chemistry Symposium held in celebration of the International Year of Chemistry in Sao Paulo, Brazil in August 2011. Four Nobel Prize Winners in Chemistry were among the invited speakers at this symposium. This grant was one of sixty grants awarded to graduate students from across the world on a competitive basis.

## STAFF-STUDENT EXCHANGE PROGRAMME

**Drs. Paul Maragh** and **Roy Porter** visited the University of Gothenburg in Sweden in March 2012 as part of the programme of staff-student exchange funded by the Linnaeus-Palme Foundation. One undergraduate student (Keisean Stevenson) and one graduate student (Janese Henderson) from Mona, spent semester 2 at the University of



Gothenburg under the aegis of this exchange programme. Visiting our department from Gothenburg was **Prof. Johan Boman** and one undergraduate student, Jannie Staffanson. Prof. Boman, an atmospheric physicist, delivered four research seminars and a lecture to undergraduate students taking the course Chemical Analysis II and participated in discussions geared towards launching a collaborative research programme in atmospheric science. This exchange programme is coordinated by **Prof. Ake Nilsson** (Gothenburg) and **Dr. Novelette Sadler-McKnight** (UWI).

## SEMINARS

Under the leadership of the Seminar Coordinator, Dr. Marvadeen Singh-Wilmot, members of the department enjoyed an active seminar programme. Eighteen seminars spanning a wide range of topics were delivered by visitors, faculty and postgraduates.

## PAPERS PRESENTED

- **C. S. Bowen-Forbes**, K. S. McCook-Russell, M. G. Nair, N. P. Seeram and Y. Tao “Health-promoting properties of exotic Jamaican fruits”. 43rd Central Regional Meeting of the American Chemical Society, Dearborn, MI, United States, June 5-9 2012.
- **R. J. Lancashire**, “Edward, William and Wilton Turner –part of Jamaica’s scientific heritage?” (Oral presentation). 43rd IUPAC World Chemistry Congress, San Juan, Puerto Rico, 30th July – 7th August 2011.
- K.-A. Green, T. P. Dasgupta, **P. T. Maragh** and K. Abdur-Rashid, “Chiral *N*-heterocyclic carbenes and acyclic diaminocarbenes: synthesis, characterization and application to asymmetric transition metal catalyzed reactions”. 43rd IUPAC World Chemistry Congress, San Juan, Puerto Rico, 30th July – 7th August 2011.
- A. Stephens-Gayle, **D. A. Minott**, “Caffeine content and cup taste profile of *Coffea arabica* var *typica* (coffee) grown at different

altitudes in Jamaica”. International Food and Nutrition Conference (IFNC), Tuskegee, Alabama, USA, 9<sup>th</sup> – 11<sup>th</sup> October 2011.

- **N. Sadler-McKnight** and J. Samuels, “An Insight into the Molecular Mechanisms of Molybdoenzymes using Molybdenum (V) Complexes and different Substrates as Model Systems” (Oral presentation). 43<sup>rd</sup> IUPAC World Chemistry Congress, San Juan, Puerto Rico, 30<sup>th</sup> July – 7<sup>th</sup> August 2011.
- **N. Sadler-McKnight** and I. Miller, “Implementation of PLTL in a Caribbean University: Successes, Challenges and Implications” (Oral presentation). The First Annual Conference of the Peer-Led Team Learning International Society (PLTLIS), New York City College of Technology, CUNY, New York, USA, May 17-19, 2012.
- I. Miller and **N. Sadler-McKnight**, “Improving student attitudes and performance in Introductory Level Chemistry through the Peer-Led Team Learning Approach”, PLTL Conference, City College of New York, New York, USA, July 10-11, 2012.
- **M. A. Singh-Wilmot**, “Lanthanide Metal-Organic Framework Materials: Syntheses, Structures and Luminescence” (Poster). 22<sup>nd</sup> General Meeting TWAS, Trieste, Italy, November 21-23, 2011.

**24<sup>th</sup> Mona Symposium on Natural Products and Medicinal Chemistry, Kingston, Jamaica, 2<sup>nd</sup> – 6<sup>th</sup> January 2012.**

- **C. S. Bowen-Forbes**, K. McCook-Russell, V. Mulabagal, Y. Liu, M. G. Nair, T. Yuan, N. P. Seeram. “Health-beneficial properties of uncommon Jamaican fruits”.
- **A. T. Brown** and S. R. Jarrett, “Towards a heterocyclic conformational analogue of (*E*)-caracasamide”
- O. V. Barrett, N. K. Downer-Riley and **Y. A. Jackson**, “New methodology toward synthesis of benz-fused-azoles and their analogs

- K.-A. Green, T. P. Dasgupta, **P. T. Maragh** and K. Abdur-Rashid, “N-Heterocyclic carbenes – synthesis, characterization and application to transition metal catalyzed reactions”.
- P. C. Facey and **R. B. Porter**, “Bioactive compounds from endophytic fungi associated with Jamaican mangroves”.

**9<sup>th</sup> Conference of the Faculty of Pure and Applied Sciences, University of the West Indies, Mona, April 13-15, 2012.**

- T. F. Campbell and **C. S. Bowen-Forbes**, “Anthocyanin, essential oil profiles and the antioxidant properties of *Rubus rosifolius*”. Poster.
- S. Gilbert, **M. A. Singh-Wilmot**, Z. Min, C. Cahill, M. Andrews, C. Rowland, “Lanthanide(III) Coordination Polymers and Framework Materials of 1,3,5-tris(4-carboxyphenyl)benzene” (Poster).
- Z. Min, **M. A. Singh-Wilmot**, C. Cahill, M. Andrews, “Reticular Synthesis in Lanthanide Metal-Organic Frameworks (Ln-MOFs): Crystal Engineering for Greater Tunability”.
- R. Sinclair, **M. A. Singh-Wilmot**, M. Andrews, C. Rowland, C. Cahill, M. Murugesu, “Lanthanide(III) Nanoclusters: Synthesis and Characterization” (Poster).

## **PUBLICATIONS**

### **Refereed Journal Articles**

- \* **M. Bakir**, O. Brown, “Spectroscopic and electrochemical properties of di-2-pyridyl ketone thiosemicarbazone [dpktscl] in non-aqueous media”. *Journal of Molecular Structure* 2011, 1006 (1-3), 402-408.
- \* **M. Bakir**, C. Gyles, “Synthesis and physicochemical properties of fac-[Re(CO)<sub>3</sub>( $\eta^2$ -N,N-dpkfah)Cl], dpkfah = di-2-pyridyl ketone 2-furoic acid hydrazone: the molecular structure of fac-[Re(CO)<sub>3</sub>( $\eta^2$ -N, N-dpkfah)Cl]acetone” *Journal of Coordination Chemistry* 2011, 64(10), 1743-1757.

- \* K. P. McCook-Russell; M. G. Nair, P. Facey, **C. S. Bowen-Forbes**, “Nutritional and nutraceutical comparison of Jamaican *Psidium cattleianum* (strawberry guava) and *Psidiumguajava* (common guava) fruits”. *Food Chemistry* 2012, 134(2), 1069-1073.
- \* S. Bryan, R. Alexander-Lindo, **T. Dasgupta**, D. McGrowder, “The effect of nitric oxide inhibitors and *S*-nitroso-*N*-acetylpenicillamine on glucose concentration in an animal model”. *Journal of Natural Science, Biology and Medicine* 2011, 2(1), 80-86.
- \* S. Bryan, R. Alexander-Lindo, **T. Dasgupta**, D. McGrowder, “The effect of nitric oxide inhibitors and *S*-nitrosothiols on hemodynamic parameters in an animal model”. *Open Access Animal Physiology* 2011, 3, 1-8.
- \* P. N. Nelson, **H. A. Ellis**, “Structural, odd-even chain alternation and thermal investigation of a homologous series of anhydrous silver(I) *n*-alkanoates”. *Dalton Transactions* 2012, 41(9), 2632-2638.
- \* R.A. Taylor, **H. A. Ellis**, “Thermotropic mesomorphic and odd-even melting behaviour of a homologous series of zinc(II) *n*-alkanoates”. *Molecular Crystals and Liquid Crystals* 2011, 548(1), 37-54.
- \* N. Downer-Riley, **Y. A. Jackson**, “Highlight syntheses” *Annual Reports on the Progress of Chemistry, Section B: Organic Chemistry* 2012, 108, 147-170.
- \* M. A. Lawrence, **P. T. Maragh**, T. P. Dasgupta, “Mechanistic studies of the selective reduction of ruthenium(III) containing trinuclear oxo complexes by L-ascorbic acid in aqueous solution” *Transition Metal Chemistry* 2012, 37(6), 505-517.
- \* **P. T. Maragh**, “Mechanisms in solution” *Annual Reports on the Progress of Chemistry, Section A: Inorganic Chemistry* 2012, 108, 369-388.

- \* M. A. Lawrence, **P. T. Maragh**, T. P. Dasgupta, “Mechanistic studies on the intra-molecular electron transfer in the adduct species of some oxo-centred trinuclear iron(III)/chromium(III) cations and L-ascorbic acid in aqueous acetate buffer”. *Inorganica Chimica Acta* 2012, 388, 88-97.
- \* G. Bent, **P. T. Maragh**, T. P. Dasgupta, “Acrylamide in Caribbean foods - Residual levels and their relation to reducing sugar and asparagine content”. *Food Chemistry* 2012, 133(2), 451-457.
- \* S. J. Dundee, **D. A. Minott**, “Impact of seed size on residual hypoglycin levels in ackee” *Food Research International* 2012, 47(2), 306-309.
- \* A. Luque, **W. H. Mulder**, J. A. Calvente, A. Cuesta, R. Andreu, “Proton Transfer Voltammetry at Electrodes Modified with Acid Thiol Monolayers”. *Analytical Chemistry* 2012, 84(13), 5778-5786.
- \* **W. Mulder**, H. I. Hassan, “The effect of orientational disorder of the anion in calcite on the aragonite (Pmcn) ? calcite ( $R\bar{3}c$ ) equilibrium”. *Canadian Mineralogist* 2011, 49(4), 1035-1043.
- \* M. McNeil, P. Facey, **R. Porter** “Essential oils from the *Hyptis* genus- a review (1909-2009)” *Natural Product Communications* 2011, 6(11), 1775-1796.
- \* K. P. McCook, A. R. Chen, W. F. Reynolds, **P. B. Reese**, “The potential of *Cyathus africanus* for transformation of terpene substrates”. *Phytochemistry* 2012, 82, 61-66.
- \* P. C. Peart, A.R. Chen, W. F. Reynolds, **P. B. Reese**, “Entrapment of mycelial fragments in calcium alginate: A general technique for the use of immobilized filamentous fungi in biocatalysis”. *Steroids* 2012, 77(1-2), 85-90.
- \* Z. Min, **M. A. Singh-Wilmot**, C. L. Cahill, M. Andrews, R. Taylor, “Isorecticular lanthanide metal-organic frameworks: syntheses, structures and photoluminescence of a family of 3D

phenylcarboxylates”. *European Journal of Inorganic Chemistry* 2012, 2012(28), 4419-4426.

## Patent

- \* T. H. Yee, **H. M. Jacobs**, “Simplified process to extract quassinoids”. PCT Int. Appl. 2012, WO 2012104728 A1 20120809.

## WORKSHOPS AND CONFERENCES ATTENDED

### WORKSHOP ON GREEN TECHNOLOGIES

Ten graduate students and seven faculty members from the Departments of Chemistry and Physics attended a workshop on **Green Technologies** mounted by the Yale Center for Green Chemistry & Green Engineering, 17<sup>th</sup>-18<sup>th</sup> August 2011 at the Rose Hall Hilton Hotel. The workshop was organized by Prof. Mitko Voutchkov with funding from the Environmental Foundation of Jamaica and Petrojam. The aims of the workshop were to promote local capacity building in green technology research and development in government, industry and academia and to establish collaborations between Jamaican stakeholders and leading scientists in fields of green chemistry, materials and energy. The keynote lecture was delivered by Prof. Paul Anastas, Director of the Yale Center for Green Chemistry and Green Engineering.

## INCOME GENERATION & RESEARCH GRANTS

Dr. N. Sadler-McKnight - SEK **292,000** (J\$3,925,128) from the Linnaeus-Palme Foundation to support staff/student exchange programme for academic year 2012-13 between the Departments of Chemistry, University of Gothenburg, Sweden and the Mona Campus of UWI. This programme is being funded for the sixth consecutive year.

The Departments of Chemistry and Physics working in association with the Youth Crime Watch of Jamaica, which is a campus based Community organization, received a grant of US\$50,000 from the Global Environment Facility (GEF) Small Grants Programme (SGP) to set up a pilot scale biodiesel manufacturing unit to produce biodiesel from waste

vegetable oil. The project is targeting waste oil produced on-Campus and in surrounding communities and the resulting biodiesel is being considered for use as a blend to fuel heavy duty University vehicles. **Dr. Michael Coley** coordinates project activities in the Department of Chemistry.

**Dr. Anthony Greenaway** received funding from the American Society for Limnology and Oceanography (ASLO) of US\$3000 for 12 months to support a River Watch project in which pupils at schools in St. Elizabeth will sample and analyse (pH, alkalinity, conductivity, bacteria) water collected from the Black River within the vicinity of the schools.

Consultation Fees and rental of facilities – **J\$2.8 M**

Better Process Control School **J\$5.5 M**

## **PUBLIC SERVICE**

### **Prof. M. Bakir**

- Referee to the Journals: *Coordination Chemistry*, *Inorganic Chemical Communications*, *Talanta* and *Polyhedron*.

### **Dr. C. Bowen-Forbes**

- Facilitator, First Year Experience (FYE)

### **Prof. T. Dasgupta**

- President, Caribbean Academy of Sciences
- Executive Committee Member, Regional Office of International Council of Science
- Treasurer, Caribbean Community of Sciences
- Member, Organizing Committee of UNITAR Project (Office of Prime Minister)
- Chairman, National Adhering Organization for IUPAC
- Member, International Panel of Academies
- Member, Third World Academy of Sciences

**Prof. H. Ellis**

- Member, Bureau of Standards Jamaica Paints and Surfaces Committee.

**Dr. W. Gallimore**

- Member, 24<sup>th</sup> Mona Symposium Organising Committee
- Facilitator, First Year Experience (FYE)

**Dr. A. Greenaway**

- Member, National Ozone Commission.
- Member, Bureau of Standards Jamaica Water System Components Technical Committee.
- Member, Jamaica National Agency for Accreditation Technical Advisory Committee.

**Prof. Y. Jackson**

- Regional Editor, MOLECULES.
- Reviewer for paper submitted to *Synthesis*, *European Journal of Chemistry*, *ARKIVOC*, *Synthetic Communications*, *Tetrahedron Letters*.
- Member, Board of Governors, Hampton School for Girls.

**Prof. H. Jacobs**

- Member, Organic Chemistry Division of the International Union of Pure and Applied Chemistry (IUPAC)

**Prof. R. Lancashire**

- Secretary, Caribbean Academy of Sciences.
- Secretary of IUPAC Committee on Printed and Electronic Publications (CPEP).
- IUPAC representative, ICSU Committee on Data for Science and Technology (CODATA).

**Dr. P. Maragh**

- Assistant Chief Examiner CXC CSEC Chemistry
- External Examiner for Chemistry, University of Technology
- External Examiner for Chemistry, Joint Board for Teacher Education



- External Examiner for Chemistry (Science & Technology), MICO University
- External Examiner for Chemistry, College of Agriculture, Science & Education

**Dr. D. Minott-Kates**

- Member, National Codex Committee (Codex Alimentarius Commission) Sub-Committee on Processed Fruits & Vegetables (Bureau of Standards Jamaica)
- Member, National Food Standards Committee (Bureau of Standards Jamaica)
- Member, Scientific Research Council Food Technology Sub-Committee of the Board of Directors
- Board member, Grove Primary School (Gordon Town Road, St Andrew)
- Secretary, Mona Preparatory School Parent Teacher's Association

**Dr. W. Pinnock**

- Faculty of Pure and Applied Sciences Rep. – University Hospital of the West Indies Research Ethics Committee
- Board Member, National Water Resources Authority
- Chairman, Technical Advisory Sub-Committee, National Water Resource Authority

**Dr. R. Porter**

- Member, Technical Committee for Propane-Butane Liquefied Petroleum Gas standards, Bureau of Standards Jamaica.
- Member, Technical Committee (TC 93) for all standards relating to starch and its by-products, Bureau of Standards, Jamaica.

**Dr. R. Rattray**

- Secretary, Laboratories Association of Jamaica
- Director, Lions Club of Mona

**Prof. P. Reese**

- Member, West Indies Group of University Teachers Executive Committee; Negotiating Committee

- Member, Equine Drug Testing Committee, Jamaica Racing Commission.
- Member, Product Research & Development Committee, Scientific Research Council.
- Board Member, Jamaica National Agency for Accreditation, Ministry of Industry, Technology, Energy & Commerce.
- Chair, ISO/IEC 17025 Technical Advisory Committee; Member, ISO/IEC 15189 Technical Advisory Committee

**Dr. N. Sadler-McKnight**

- Coordinator, CAPE Chemistry Workshop
- Executive Secretary, Chemistry Alumni and Friends (CHEMSAF)
- Member, Technical and Finance Committee of the Scientific Research Council (SRC)
- Faculty Advisor, UWI Circle K Club
- External Examiner, Chemistry, College of Agriculture, Science and Education (CASE)

**Dr. M. Singh-Wilmot**

- Coordinator, Departmental Seminar series
- Member, Curriculum Reform Committee.
- Co-chair, Young Scientist Ambassador Program (YSAP)
- Young Affiliate Fellow, TWAS