

## DEPARTMENT OF PHYSICS

Dr. Joseph Skobla, MSc, PhD, TU Bratislava/U of Toronto,  
– Head of Department

### WORK OF THE DEPARTMENT

The main targets of the Department of Physics for the academic year August 1, 2006 to July 31, 2007, included restructuring of the undergraduate and postgraduate programmes; introducing a new outreach programme, dealing with the problem of inadequate academic staffing, and improving and refurbishing the department's infrastructure.



#### Course Development

Two new majors were developed and introduced in September 2006: General Physics and Alternative Energy. The undergraduate programme in Alternate Energy Studies and the Commissioning of Wind-solar Hybrid system were launched in January 2007. Our postgraduate students have assisted in developing a new Certificate in Electronics Technology (not a university matriculation programme) for 2006/07. Postgraduate students have also helped (for two weeks, from July 9) in the teaching of the Robotics programme for high school students which has been offered in collaboration with a non profit UK organization “Generating Geniuses”. This year's closing ceremony for the generating Genius Youth Programme was held on July 22, 2007, at the Gold Room, Mona Visitors' Lodge.

#### Outreach

In order to generate more interest in Physics the Outreach Programme made planned visits in December 2006 to a number of high schools. Workshops were held from January 9-12, 2007 based on the CAPE Physics syllabus on Operational Amplifiers for high school students and Two Hundred and Thirteen (213) students and eight teachers from nineteen (19) high schools participated with four (4) academic staff members and nine (9) postgraduate students from the Physics Department. As a result a 35 page manual was developed in collaboration with the Electronics Unit on the theory of OP AMPS for CAPE students. The department also accommodated a number of students, visiting from high and preparatory schools, to view Physics demonstrations and the use lab equipment, for example, Clarendon High, Hillel Academy and Vaz and St. Peter and Paul preparatory schools. The department hosted an International Workshop on Climate Scenarios and User Interaction December 11-12, 2006 with 35 scientists from 9 countries participating

### **Teaching**

The inadequate staffing situation which previously existed was slightly eased with an increase of 3 in the temporary full-time staff. The number of academic staff during the year was (12) twelve full-time with five (5) part-time appointments. Student assessment of lecturers and the undergraduate courses offered remained at a satisfactory level. The average student evaluation for undergraduate courses was 3.96 for lecturers and 3.65 for courses.

### **Staff Development**

During February 1-2, 2007, three members of staff attended a seminar put on by the Instructional Development Unit titled "Engaging Students to Think" to improve teaching methods and the presentation of lectures. Miss Cassandra Rhoden, attended the Joint IAI-NCAR Colloquium on Policy Planning and Decision-making involving Climate Change and Variability during September 11-22, 2006 at the National Center for Atmospheric Research, in Boulder Colorado, USA. Mr. Leonardo Clarke participated in a workshop at the ICTP-ITU-URSI School on Wireless Networking for Scientific Applications in Developing Countries at the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy, during. February, 5-23, 2007.

### **Targets for 2007/8**

The main targets set by the department for the coming year include the following: The MSc in Digital Technology postgraduate programme has been revised and teaching will begin in September 2007/8.; it is expected to launch an additional major in Material Sciences in 2007/8. In the 2007/8 academic year we plan to increase registration of first year Physics students by 50%. There is a need to develop and establish a new departmental scheme with respect to the organization of new academic programmes. To further promote Science and Technology in Jamaica we are proposing to enhance the activity of the IEEE section of the Physics department, revitalize the students' Electronics/Robotics Club and find financial support for a new Amateur HAM Radio Club. We believe that this activity will attract more male students to FPAS. To continue accommodating the visit of students from preparatory and high schools by enlisting financial support from Financial & General Purposes Committee for this programme.

#### **PAPERS PRESENTED**

- J. D. Campbell, M. A. Taylor, T. S. Stephenson and F. S. Whyte, 2007: "Generating future climates for the Caribbean using PRECIS", *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract GC22A-05.
- M. A., Taylor, and J. D. Campbell, 2007: "A Future Caribbean Climate from the PRECIS RCM". *Proceedings, Climate Change Impacts on the Caribbean*. UWI, June 2007.
- F. S. Whyte, M. A. Taylor, T. S. Stephenson and J. D. Campbell, 2007: "Features of the Caribbean Low Level Jet", *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract H51G-08.
- R. Watson, and M. A. Taylor, J. D. Campbell and T. S. Stephenson, 2007: "What to expect? Jamaica's future climate from climate models". *Proceedings of the 3rd Conference on the Environment*. Jamaica Institute of Environmental Professionals. Kingston, Jamaica. May 2007.
- M. A. Taylor, and J. D. Campbell, 2007. "Lessons from the Caribbean PRECIS Climate Change Project – A regional collaborative initiative". *United Nations Framework Convention on Climate Change (UNFCCC) Expert meeting on Adaptation for Small Islands Developing States (SIDS)*, Kingston, Jamaica. February 2007.

## **PUBLICATIONS**

### **Books and Monographs**

- \* A. Anthony Chen, Dave D. Chadee and Samuel C. Rawlins, Editors. Climate Change Impact on Dengue: The Caribbean Experience, Climate Studies Group Mona, UWI, 104 pages 2006, ISBN: 976-41-0210-7
- \* M.A. Taylor, Centella, A., Charlery, J., Borrajero, I., Bezanilla, A., Campbell, J., Rivero, R., Stephenson, T. S., Whyte, F., Watson, R. (2007). Glimpses of the Future: A Briefing from the PRECIS Caribbean Climate Change Project, Caribbean Community Climate Change Centre, Belmopan, Belize, 24 pages. ISBN: 978-976-41-0212-2

### **Other Peer Reviewed Publications**

- \* J.H. Christensen, B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magana Rueda, L. Mearns, C.G. Menendez, J. Raisanen, A. Rinke, A. Sarr and P.Whetton.: "Regional Climate Projections". Climate Change 2007, The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge , United Kingdom and New York, NY , USA

### **Refereed Journal Articles**

- \* M. A. Taylor, D. Amarakoon, A. Anthony Chen, S. C. Rawlins and D. Chadee, 2006: Climate Dengue and Prevention: "Observations from the Caribbean". The Americas: Building the Adaptive Capacity to Global Environmental Change. Edited by A. Fenech et al., Environment Canada. Toronto, Ontario, Canada. 254 p.
- \* T. S. Stephenson, A. A Chen, and M. A. Taylor, 2007: "Toward the development of prediction models for the primary Caribbean Dry Season". Theoretical and Applied Climatology. DOI 10.1007/s00704-007-0308-2.

- \* Whyte, F. S., M. A. Taylor, T. S. Stephenson, J. D. Campbell, 2007: Features of the Caribbean Low Level Jet. International Journal of Climatology. DOI: 10.1002/joc.1510
- \* Stephenson, T. S., M. A. Taylor and A. A. Chen, 2006: "Investigating the predictability of early and late season rainfall for Jamaica". Jamaica Journal of Science and Technology, 16& 17, 2-17.

## **INCOME GENERATION**

The income generating projects for the academic year 2006/7 were as follows:

- Dr. Michael Taylor secured J\$2,130,000.00 funding from the Caribbean Community Climate Change Centre of Belize for Generating Climate Change scenarios for the Caribbean
- Dr. M.A. Taylor, Dr. A.D. Amarakoon and Prof. A.A.Chen \$J2.2 million for the project Enhancing Education in Alternative Energy, from the Environmental Foundation of Jamaica (EFJ) in 2006.
- Dr.J. Skobla, Dr. F. Ionica. Research Project: "Measuring Methods And Data Analysis From Highway 2000", Kingston, Jamaica, Research and Development grant - J\$4,000,000.00, Trans Jamaican Highway Ltd., 2006.
- Dr. J. Skobla., Mr. R. Bent. Proposal submitted for Research Project: "Rain Gauge Network With Remote Data Sensing" valued at J\$ 5,411 590.00 from the Meteorological Office, Kingston, November 2006
- Dr. J. Skobla, Dr. F. Ionica, Mr. R. Bent, Mr. L. Clarke. Proposal for Research Project "Integrated Early Warning System for Jamaica" was presented at NEPA; Representative from NWC, WRA Met Service, ODPEM and MLGE supported proposal valued at J\$15,980,751.71 April 18, 2007.

## **PUBLIC SERVICE**

Douse, V.

- Chairman, Cement Technical Committee at the Bureau of Standards, Jamaica

Chen, Prof. A.A.

- Convenor, Climate Change and Biodiversity in the Caribbean

Dr. M. Taylor

- Reviewer, Journal of Geophysical Research, Atmospheres and the Journal of Climate

Skobla J.

- Reviewer, World Scientific Publishing House, Singapore. International Journal of Neural Systems.
- Convener, of the Caribbean Advanced Proficiency Examination (CAPE),
- Chair, Physics Panel

## INFORMATION ON STUDENTS

The department offered a total of 30 undergraduate courses in 2006/7 with an enrolment of 584 in Semester 1 and 529 in Semester 2. The number of students enrolled in undergraduate courses for Semesters 1 and II are shown below:

Number of Students Enrolled in Semesters 1 & II, 2006/7

Year	Semester I	Semester II	Year Total
1st Year	193	196	389
2nd Year	221	190	411
3rd Year	170	143	313
Semester Total	584	529	1113

The department offered 6 postgraduate courses for MPhil/MSc degrees with 8 postgraduates registered in Semester 1 and 24 in Semester II. The areas of study included Electronics, Climate Scenarios, Materials Science, Statistical Methods in Atmospheric Physics, Project Management Fundamentals, Microprocessors, Computer Networks and Microcontrollers. Three (3) MPhil degrees were awarded and 3 submitted. Five (5) students satisfied the requirements for the award of the MSc degree in Digital Technology. Mr. Jayaka Campbell attended a workshop on Providing Regional Climate for Impact Studies (PRECIS) at the UK Hadley Centre in Belize during 25-29 September 2006. Three (3) PhD students were enrolled in 2006/7, one has

subsequently withdrawn and gone abroad. The postgraduate students were supervised as follows: J.Skobla (5 MPhil, 1 PhD); M.Taylor (5 MPhil, 2 PhD); A. Amarakoon (3 MPhil), D.Walwyn (3 MPhil), A. Chen (1 MPhil).

### **Prizes Awarded**

Prof. Anthony Chen, Dr. A.M.D. Amarakoon and Dr. Michael Taylor were awarded for The Most Outstanding Research Activity on their project “The Threat of Dengue Fever – Assessment and Impact and Adaptation to Climate Change in Human Health in the Caribbean”, Awards ceremony, held at Mona Visitor's Lodge on January 26, 2007.

Mr. Jayaka Campbell was awarded for the Outstanding Student Paper at the American Geophysical Union 2007 Joint Assembly Conference in Mexico during May 22-25 2007.