DEPARTMENT OF PHYSICS

Joseph Skobla, MSc, PhD *TU Bratislava, U of T Toronto*
– Head of Department

WORK OF THE DEPARTMENT

The Department of Physics, for the Academic year August 1, 2005 to July 31, 2006, had a set of objectives and was able to achieve the majority of these proposed targets in good time.

The main targets included the (1) development of a Certificate course and Associate Degree in Electronics Engineering which is expected to come on stream in 2006/7. (2) The creation and restructuring of four (4) new majors that will be taught in the next academic year 2006/7 – a) General Physics, b) Alternative Energy, c) Environmental Physics d) Electronics Production of a Summer Programme in Physics and special course in Robotics, "Generating Geniuses". The aim is to introduce students to the world of robotics, their functions and usefulness in our society. Identifying the inventory stock in the department was achieved and the department is now able to assess both the current and future requirements of the laboratories and the offices.

The department had hoped to have a new proposal for the MSc Digital Technology programme restructured and approved early. This was, however, partially achieved as the Department is still waiting on a response for this programme.

There was a Self-Assessment and Review of the Physics Department in February 2006.

Teaching

The department had ten full-time and seven part-time academic staff members employed during the academic year and the publication output remained the same as last year, 0.6 % per capita.

The number of undergraduate courses increased slightly and, in a few cases the policy for small class size was affected. However, there was one drawback to this as the department experienced a severe shortage of academic staff. Student assessment of lecturers and the undergraduate courses offered remained at a satisfactory level. The average lecturer student evaluation for undergraduate courses was 4.05 (SD 0.42) for lecturers and 3.80 (SD 0.31) for courses. All staff members in the department have used the services of the Instructional Development Unit.

In order to produce students of quality, the department identified and introduced the following areas:

(1) Study groups

(2) select undergraduates to assist as scientific assistants in research areas

(3) encourage undergraduate and postgraduate students to work in the Electronics and Robotics clubs

(4) improved lab experiments

(5) the continuation of departmental seminars to improve communication between students and staff

The research activity of the department continued to be in the following areas:

Climate studies and modeling

The effects of climate change on crops and health

Global Positioning Systems (GPS) applications – with special emphasis on the Jamaican transportation sector.

Photovoltaic applications

Communication coding studies

Lightning studies

Renewable Energy Studies

Material Sciences.

Staff

In March 2006, Dr. Leary Myers applied for one year's no pay leave to assume the post of Chief Executive Officer in the National Environment and Planning Agency.

During September 10-17, 2005, Dr. Michael Taylor, participated in the AIACC (Assessment Impacts and Adaptation to Climate Change) workshop in Naivasha, Kenya. The Department hosted a 2-week Climate and Health IAI workshop in November 2005, UWI, Physics Department, Mona. Thirty (30) participants across North America, Latin America and the Caribbean attended. Climate Studies Group Mona (CSGM) Prof. Anthony A. Chen, Dr. Dharmaratne Amarakoon, and Dr. Michael Taylor presented papers at the 19th Annual Conference on Science and Technology, put on by the Scientific Research Council (SRC) in Jamaica, Kingston, Jamaica, November 22-24, 2005. At this conference Dr. Michael Taylor was given the Scientific Research Council's Young Scientist/ Technologist of the year Award. In December 2005, the department also hosted a meeting of the Caribbean Precis Modeling Community with representatives from eight (8) Caribbean countries participating. Professor Chen was appointed a Lead Author for the chapter on Climate Projections with responsibility for Small Island States for the 4th Inter-Governmental Panel on Climate Change (IPCC) Assessment Report. He attended the Third Meeting of IPCC Working Group 1 for Lead Authors for the 4th Assessment of IPCC from December 12-15 in New Zealand. In January 9-12, 2006, Dr. Taylor was accompanied by 3 post-graduate students (Trevor Hall, Jayaka Campbell and Lawrence Brown) to a training workshop on the use of the (MM5) model on regional climate in the Caribbean at Cave Hill Campus, Barbados. This was sponsored by the CCCCC. In April 2006, members of the academic staff attended a meeting in Barbados, with Physics staff members from the other 2 campuses to discuss the Future of Physics at the University of the West Indies. Staff members continue to assist in evaluating the Teacher Education Joint Board B.Ed. Distance Secondary Education programme and in offering the services of the Physics Laboratories to 5th and 6th formers from high schools. Dr.Joseph Skobla was appointed CXC CAPE convener and chairman of the Physics panel.

PAPERS PRESENTED

- **Ponnambalam M. J**; "Arithmetic Skill: An Endangered Species". American Assn. of Physics Teachers Meeting in Salt Lake City, Utah, USA, August 2005.
- **Amarakoon, A. M. D., T. Stephenson, A. A. Chen, M. A. Taylor**, **R. Stennett**, C. Heslop Thomas, W. Bailey, S. Rawlins, D. Chadee, 2005: Associations of Climate with Dengue in the Caribbean, Wengen Workshop on "Global Change Research 10th

Anniversary Meeting; Wengen (Bernese Alps) Switzerland, September 12-14, 2005.

- **Amarakoon, D., Anthony Chen**: "Potential for Wind Hybrid Energy Systems in Jamaica;" SRC 19th Annual Conference on Science and Technology; November 22-24, 2005, Kingston, Jamaica
- **Taylor, M. A., T. S. Stephenson**, S. A. Ashby, 2005: "Toward the production of Seasonal Forecasts and Climate Change Scenarios for the Caribbean". SRC 19th Annual Conference on Science and Technology; November 22-24, 2005, Kingston, Jamaica.
- **Taylor, M. A**., 2006: "An Overview of Caribbean Climate". Invited Keynote, Caribbean Climate Change Symposium. University of Puerto Rico – Mayaguez, April 23-25, 2006.
- **Taylor, Michael,** "Regional Models: A Potential Tool for Planning and Preparedness in the Caribbean" April 2006, Annual Meeting of CDERA (Caribbean Disaster Emergency Response Agency) in Belmopan, Belize.
- **Crossbourne, R. F**., **M. A. Taylor**, **A. M. D. Amarakoon**, 2006: CCID – "Making Caribbean Climate Data accessible to the Region". American Geophysical Union Spring Meeting, Baltimore, USA. May 23-26, 2006
- **Stephenson, Tannecia,** Use of MM5 for Regional Planning, Caribbean Community Climate Change Centre (CCCCC) MM5 Workshop. Antigua, June 2006.

PUBLICATIONS

* **Chen, A. A**., T. Falloon and **M. A. Taylor**, 2005: "Monitoring Agricultural drought in the West Indies", Monitoring and Predicting Agricultural Droughts: A Global Study. Edited by V. K. Boken et al., Oxford University Press

* **Taylor. M. A**. and E. J. Alfaro, 2005: "Climate of Central America and the Caribbean", Encyclopedia of World Climatology. Edited by J. E. Oliver, Springer

Other Peer Reviewed Papers

* Alexander, L. V., X. Zhang, T. C. Peterson, J. Caesar, B. Gleason, A. Klein Tank, M. Haylock, D. Collins, B. Trewin, F. Rahimzadeh, A. Tagipour, P. Ambenje, K. Rupa Kumar, J. Revadekar, G. Griffiths, L. Vincent, D. Stephenson, J. Burn, E. Aguilar, M. Brunet, **M. A. Taylo**r, M. New, P. Zhai, M. Rusticucci, J. L. Vazquez-Aguirre, 2006: "Global observed changes in daily climate extremes of temperature and precipitation". *Journal of Geophysical Research,* Vol. 111(D5) 5109 DOI: 10.1029/2005JD006290

* Ashby, S. A., **M. A. Taylor and A. A. Chen**, 2005: "Statistical models for predicting rainfall in the Caribbean". *Theoretical and Applied Climatology,* 82, 65-80. DOI 10.1007/s00704-004-0118-8

* Heslop-Thomas, C., W. Bailey, **D. Amarakoon. A. Chen**, S. Rawlins, D. Chadee, **R. Crosbourne, A. Owino**, K. Polson, **C. Rhoden**, **R. Stennett**, **M. A. Taylor**, 2006: "Vulnerability to Dengue Fever In Jamaica". *AIACC Working Paper Series* No. 27. Inter-American Institute (IAI) for Global Change Research Training Institute of Climate and Health in the Americas, 2005

* **Taylor, M. A., Chen, A. A**., S. Rawlins, C. Heslop-Thomas, **A. Amarakoon**, W.Bailey, D.Chadee, S. Huntley, 2005: "Adaptation strategies for present and increased future risk of dengue fever in the Caribbean". *AIACC Working Paper Series* No. 33, Inter-American Institute (IAI) for Global Change Research Training Institute of Climate and Health in the Americas, 2005.

INCOME GENERATION

For the period 2005/6, the total income generated by the MSc in Digital Technology Progamme amounted to $3,314,887.00 There was expenditure of approximately $8,000,000.00 made during the academic year using funds generated by the MSc in Digital Technology programme during the 2005/2006 academic year as well as surpluses retained from prior academic years. Approximately $7,500,000.00 was used to purchase laboratory equipment to support the undergraduate teaching programme and the remainder was used for remunerations and consumables associated with teaching the MSc programme. The income generated through Consultation Funds amounted to $213,334.23 and Summer School $883,061.99. Other departmental activities provided an income of $1,371,944.89.

PUBLIC SERVICE

Amarakoon, Dharmaratne

- External Examiner for the Teachers' Colleges, Years 2 and 3 that fall under Joint Board of Teacher Education

Douse, Victor

- Member, National Cement Investigation Committee: re the Release of sub-Standard Cement by Caribbean Cement Company

McTavish, John

- External Examiner, MICO Teachers' College

Skobla, Joseph

- Advisor, Bureau of Standards, Jamaica
- Advisor, Meteorological Office, Jamaica
- Convener, CAPE in Physics
- Chairman, CXC, CAPE Physics Panel
- Coordinator, BEd Secondary Distance Project for Physics

Taylor, Michael

- External Examiner, CASE, Year 1, Physics

Walwyn, Donald

- Member, Board Spectrum Management

CATEGORIES OF STUDENTS

Undergraduate

The Department offered a total of 20 undergraduate courses in 2005/6 with enrolment ranging from a high of 141 to a low of 11. Average enrolment was 48.5. One (1) student graduated with a major in Physics while 13 majored in Electronics. One (1) student graduated with First Class Honours, five (5) with Upper Second and six (6) with Lower Second.

Postgraduate

The Department offered 8 postgraduate courses for MPhil degrees with 16 postgraduate students registered in 2005/6. The areas of study included

Electronics, Climate, and Statistical Methods. Four (4) MPhil theses were submitted and one (1) PhD awarded. Fourteen (14) MSc degrees in Digital Technology were awarded.

The number of MPhil students that were supervised are as follows: Dr. Joseph Skobla five (5); Dr. Donald Walwyn four (4); Professor Anthony Chen three (3); Dr. Michael Taylor three (3); and Dr. Patrick Stephens one (1).

Prizes Awarded

The following students received Special Awards for excellence in Physics for the academic year 2005/6:

Miss Rhodene Watson – the Michael Tharmanahthan Memorial Bursary for Advanced Level Physics.

Mr. Leandio Spencer received the Digicel Bursary, Physics Departmental Prize and the Francis Haddon Bowen/University Lodge Bursary for Advanced Physics.

Miss Rochelle Walters received the John Lodenquai Prize for Introductory Physics and **Mr. Meshach Mitchell** the Physics Departmental Prize for Advanced Level Physics/Electronics.

Mr. Andrew Lyle, a graduate of the UWI, with a BSc (First Class Honors) Degree in Electronics and Computer Science was the 2005 Gleaner Youth Honour Awardee for Excellence in Education. He is currently a student at the University of Western Ontario in Canada pursuing his Master of Science Degree in Engineering.