



The Caribbean Academy of Sciences  
in collaboration with the  
Tobago House of Assembly  
presents the

# 25<sup>th</sup> Anniversary Celebrations

19<sup>th</sup> General Meeting  
and Biennial Conference

at the **MAGDALENA GRAND BEACH RESORT**

21 – 23 November 2014

**Tobago, W.I.**

**F I N A L   A N N O U N C E M E N T**

**“Harnessing Science & Technology  
To Create Knowledge-Based Economies  
And Preserve Caribbean Ecosystems.”**

Abstracts for Oral and Poster Presentations in all  
areas of Natural and Social Sciences are invited



# The Caribbean Academy of Sciences

19<sup>TH</sup> GENERAL MEETING AND BIENNIAL CONFERENCE

**S E C O N D   A N N O U N C E M E N T**

**MAGDALENA GRAND BEACH RESORT, TOBAGO**

21<sup>st</sup> – 23<sup>rd</sup> November 2014

*“Harnessing Science and Technology  
to Create Knowledge-Based Economies  
and Preserve Caribbean Ecosystems”*

**SUBMIT YOUR ABSTRACTS NOW**  
(Any area of Natural and Social Sciences)  
Deadline : 30<sup>st</sup> September

**Studentships for T&T  
Postgrad Students.  
Apply Now!**

**Prize for best  
• Oral Presentation  
• Poster Presentation**

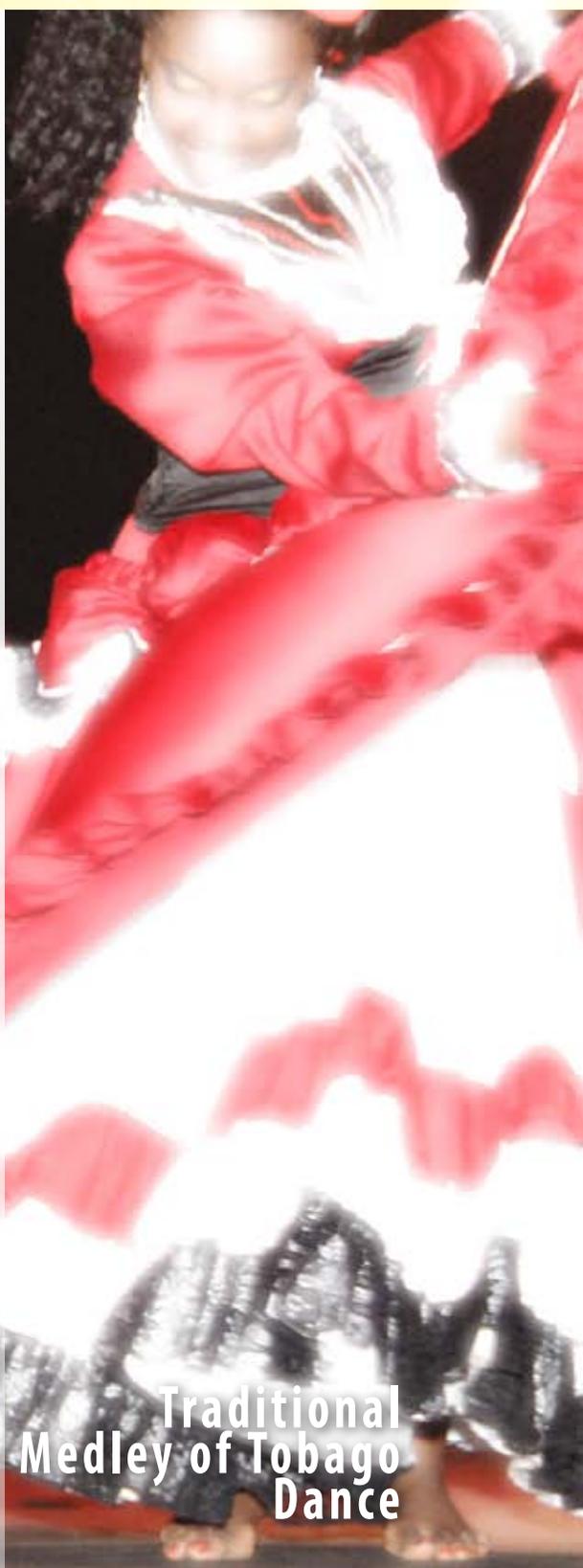
## **IMPORTANT DATES**

21 November  
**CAS General Meeting**  
1.15 pm – 4.00 pm

21 November  
**Grand Opening Ceremony**  
7.00 pm

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Traditional  
Medley of Tobago  
Dance

# introduction

The 19<sup>th</sup> General Meeting of The Caribbean Academy of Sciences (CAS) is the second to be held in the beautiful island of Tobago which forms one half of the twin island state of Trinidad and Tobago. The Biennial Conference, which is being held in collaboration with The Tobago House of Assembly, will commence on the evening of 21<sup>st</sup> November 2014 with an impressive opening ceremony. The venue and official accommodation for the Conference is the Magdalena Grand Beach Resort, Tobago.

The theme of the Conference is ***“Harnessing Science and Technology to Create Knowledge-Based Economies and Preserve Caribbean Ecosystems.”***

One of the main objectives of the Conference is to assemble regional and international natural scientists, social scientists and engineers to deliberate and focus their thoughts on the two areas identified in the theme. Using the best available models, one fraction of the scientists will be encouraged to develop road-maps suggesting ways towards the establishment of knowledge-based economies in the Caribbean region. Another fraction of the scientists will be required to propose steps that might reverse some aspects of climate change and strategies that could minimize the adverse effects of climate change on the fragile ecosystems of the Caribbean.

A second major objective of the Conference is to provide an opportunity, via parallel scientific sessions, for experts from the region’s Universities, Research Centres and Industry to come together to present their research, industrial and developmental findings for critical analysis. The scientific programme will consist of plenary lectures by invited experts and short papers of 20 minutes total duration by participants. Short papers may be in any area of natural science and social science, including Agriculture, Medicine, Veterinary Medicine, Anatomy, Physiology, Pharmacology, Chemistry, Biochemistry, Biology, Biotechnology, Energy, Food Science, Physics, Engineering, Education, Economics and Health Economics.

**Note: The Academy’s General Meeting, for financial members, takes place on 21<sup>st</sup> November 2014 from 1.15 pm – 4.00 pm.**

Argyle  
Waterfalls  
Roxborough, Tobago

# preparation of abstracts

Abstracts for each oral and poster presentation must be submitted via electronic mail by **30<sup>st</sup> September 2014**.

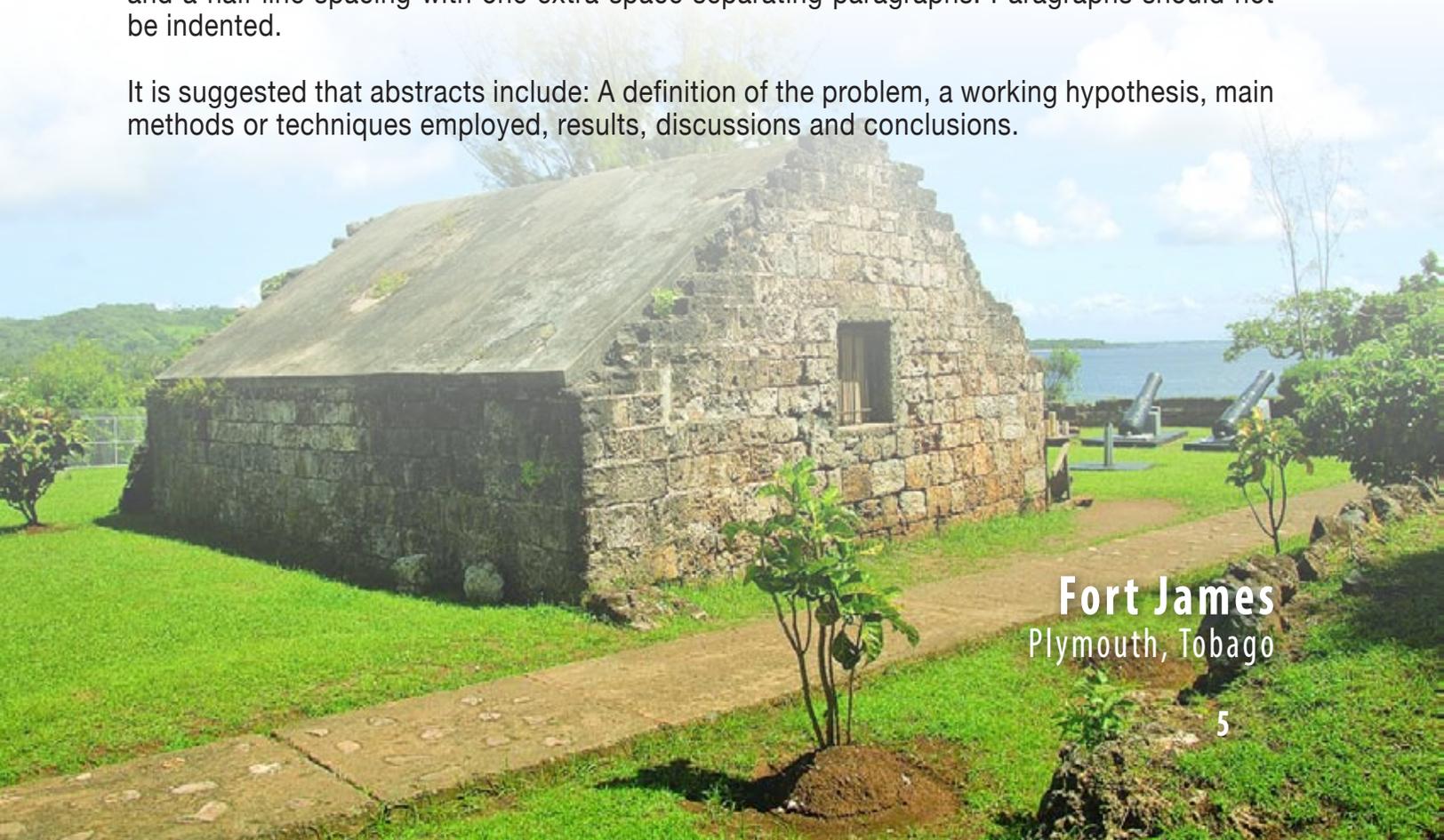
Abstracts must be typed to fit on a single sheet of letter size paper (8.5" x 11") using Times New Roman in Microsoft Word 97-2003 as minimum.

**Typing should be fully justified with one-inch margins at the top and at each side; a minimum of one-inch must be left at the bottom of the page. The entire abstract, including title, name of the author (s), affiliation (s), and text should be typed within these limits.**

The abstract Title should be centred and **bold**, "title style", in Times New Roman (12-point font). On the next line the Author(s) name(s), (11-point font, **in bold**) should be written as initial(s) followed by family name(s). Author(s) name(s) must be centred and separated by semicolons, underlining the name of the person who will present the paper. On the next line, the institution(s) of the author(s) must be typed in italics and centred. When authors originate from different institutions, the authors and the institutions should be numbered using superscripts to the top right of the names and the top left on the institutions.

The body of the abstract (**without any sub-headings**) should be in 11-point font and should start two line spaces below the institutions identification. The text should be typed using one and a half line spacing with one extra space separating paragraphs. Paragraphs should not be indented.

It is suggested that abstracts include: A definition of the problem, a working hypothesis, main methods or techniques employed, results, discussions and conclusions.



**Fort James**  
Plymouth, Tobago

# sample abstract

## **Nurseries And The Conservation Of Guyana's Mangroves: A Preliminary Survey Of Insect Pests In Mangrove Nurseries In Guyana.**

**P. Da Silva<sup>1</sup> ; S. Gillis<sup>2</sup>**

<sup>1</sup>*University of Guyana, Berbice Campus, Guyana*

<sup>2</sup>*University of Guyana, Turkeyen Campus, Guyana.*

phillip.dasilva@uog.edu.gy

Mangrove ecosystems have long been recognised for their ecological, economic, social and coastal protection values. In Guyana mangrove ecosystems are now being recognised for their role in alternative livelihood options. In an effort to assist in combating climate impacts the Government of Guyana has embarked on a conservation project that seeks to rehabilitate coastal mangrove ecosystems and thus mangrove nurseries have been gaining recognition for its role in this process and also as an alternative livelihood option. In this regard mangrove nurseries have been established by private individuals who are contracted by the Guyana Mangrove Restoration Project (GMRP) to supply mangrove seedlings.

Being a new venture in Guyana there was not much information on the potential challenges that could have been anticipated. This preliminary study sought to investigate and document the challenges faced by nursery operators in the production of *Avicennia germinans* seedlings. Specifically the investigation sought to document the types of insect pests that affected mangrove (*Avicennia germinans*) seedlings in established nurseries. The method entailed the use of a questionnaire and checklist and onsite observations to identify the various types of insect pests.

A number of challenges faced by nursery operators were identified. Insect pests from five (5) taxonomic orders and six (6) families were found to be common in the nurseries surveyed. These were observed in the growing seedlings at various leaf development stages. Representatives from the Order Lepidoptera and the Family Nymphalidae were most prevalent. Identification of these challenges and insect pests is an important step in the operation and management of mangrove nurseries.

# preparation of posters

Posters should be a maximum of 107 x 107 cm (42" x 42"). A maximum of two posters per person will be allowed. The following information should appear on each poster:

|                                      |                                           |
|--------------------------------------|-------------------------------------------|
| a. Title                             | g. Methods                                |
| b. Poster number (As assigned)       | h. Results (including Tables and Figures) |
| c. Name(s) of Author(s)              | i. Discussion                             |
| d. Name of each Author's Institution | j. Conclusions                            |
| e. Abstract                          | k. References                             |
| f. Introduction                      |                                           |

# publication policy

All Abstracts accepted for the Conference will be published in the CAS e-Journal. CAS is also extending an invitation to authors to have their full papers published in the CAS e-Journal. Note however that CAS reserves the right to reject any paper it deems unsuitable for publication in its journal. The deadline for the submission of **full papers is 30 November 2014**.

Persons wishing to have their full papers published should upload manuscripts directly to the CAS e-Journal; to do so please follow the instructions for preparation and uploading at <http://www.caswi.org/jm/ejournal>

Those without UWI Mona accounts will need to create a free account to log in.

**For further information contact**

Professor Robert Lancashire: [rjlanc@caswi.org](mailto:rjlanc@caswi.org)

Professor Neela Badrie: [neela.badrie@yahoo.com](mailto:neela.badrie@yahoo.com)

Dr. Mark Wuddivira: [wuravnakka@yahoo.com](mailto:wuravnakka@yahoo.com)

# CAS-TWAS Young Scientist Award

Applications are invited for the CAS-TWAS Young Scientist Award for 2014. The Award is worth US\$2000.00. The following conditions apply:

1. The Award shall be given to the individual who has done the most to advance the progress of Scientific Research as judged by the quality of his/her publications and/or patents in one of the following fields:- Chemistry, Mathematics, Life Sciences, Physics and Engineering.
2. The age of the applicant must not exceed 40 years during the year of the Award and must be a resident of the Caribbean region. Most of the research must also have been done in the Caribbean region. An individual can only receive one such Award.
3. The recipient of the Award will be expected to make a Scientific Presentation at the 19th Meeting of The Academy to be held in Tobago in November 2014.
4. It is to be understood that by accepting this award, the recipient is agreeing to present an update of his/her research at the subsequent CAS biennial Conference.
5. Nominations for the 2014 Award (on the required forms) should reach the Office of the CAS Secretariat by 25th September 2014.  
(Visit the CAS website for forms <http://www.caswi.org>.)

## conference timetable (November 2014)

|                                           |                                |                                                   |
|-------------------------------------------|--------------------------------|---------------------------------------------------|
| <b>Day 1</b><br>Friday 21 <sup>st</sup>   | 11.00 am – 1.30 pm             | Registration                                      |
|                                           | 1.15 pm – 4.00 pm              | CAS General Meeting                               |
|                                           | 7.00 pm – 10.00 pm             | Opening Ceremony / Cocktail Reception             |
| <b>Day 2</b><br>Saturday 22 <sup>nd</sup> | 8.30 am – 4.30 pm              | Main Conference:<br>Oral and Poster Presentations |
|                                           | 5.00 pm – Until<br>(Free Time) | Go Take Your Taste of Tobago                      |
| <b>Day 3</b><br>Sunday 23 <sup>rd</sup>   | 8.15 am – 2.30 pm              | Main Conference:<br>Oral and Poster Presentations |
|                                           | 3.00 pm – 3.30 pm              | Closing Ceremony                                  |

# Tobago

## **Tobago House of Assembly**

The Tobago House of Assembly (THA) is this country's oldest political institution. The THA was first established in 1768, pre-dating the British takeover of Trinidad in 1797. The two islands were later joined in 1889 by the British Government. The original THA was designed to govern the island for the benefit of its small ruling clique by passing laws and statutes and distributing land.

In 1977, the Tobago East representative, Arthur Napoleon Raymond Robinson along with Tobago West MP, Dr Winston Murray moved a resolution in Parliament for internal self-government for Tobago. Three years later the THA had its first election. The Democratic Action Congress won that first election and ANR Robinson was appointed its first chair.

The modern THA has 12 seats, and unlike the original body, is open to any Trinbagonian residing in Tobago. After 1980, the THA formed itself into seven divisions each representing a developmental concern. Today the THA comprises two main arms: the Legislative Arm and the Executive Arm; along with 10 divisions including the Office of the Chief Secretary which is at the helm.



**The Tobago House of Assembly**

# Tobago cont'd

## You Will Love Tobago

Tobago is a mere 300 sq km so you are never far from the sea side, the Atlantic Ocean to the east and the Caribbean Sea to the west. Bathed by the gentle breezes of the north-east trade winds the island has the most fantastic climate you will encounter. Day time temperatures are between 29°C and 32°C while night time temperatures rarely fall below 20°C. The people, mainly of African descent with a sprinkling of Indian and European descendants, are as warm as the sunshine.

The inviting blue waters and sparkling white sands of the beaches are irresistible to most visitors. The tranquil waters of the west coast are perfect for sea bathing. For the more adventurous there is jet skiing and an array of water sports to choose from. The Buccoo Reef, a wide expanse of diverse corals, an equally large collection of beautiful fish and sea animals can be viewed from flat bottom boats or by organised dives: Surfers can head to the breezier east coast. Then there is the Tobago Great Race, a 137 km boat trip from Chaguaramas, Trinidad to Store Bay, Tobago where at the end of the event you will experience the most exciting beach party 'on Earth'.

Tobago has a rich heritage of music, folklore and dance. These come to life every year from July to August as the Tobago Heritage Festival takes centre stage. Distinct Tobago dances, storytelling, plays and of course food leave patrons craving for more. The re-enactment of a 'slave-wedding', with the clothes and dances such as the 'Reel and Jig' cannot be easily described; these just must be seen. For the young and young at heart you can come to carnival at the start of the year or the Tobago Music/Jazz festival in April.

Before leaving the island you may wish to visit the Tobago House of Assembly, Fort George, Fort James and the Argyle Waterfall.

A woman in traditional Tobago folk attire, including a yellow and red striped headwrap and a yellow and red striped top, is captured in a dynamic dance pose. She is smiling and looking down, with her arms extended. The background is blurred, showing other people in similar attire, suggesting a festive atmosphere.

**Dancer at the Folk Fiesta Heritage**

# hotel accommodation

The CAS has chosen the Magdalena Grand Beach & Golf Resort as the hotel of choice for conference participants. Special concessionary rates apply to all registered participants and are applicable up to three days before and three days after the Conference. Participants may book directly or via the conference secretariat. **Please indicate that you will be attending the Conference when booking.**

The resort offers deluxe oceanfront king and double-double rooms plus one and two bedroom suites with breathtaking views of the ocean from large terraces or balconies. All of the resort's beautifully appointed rooms feature spacious marble bathrooms with both shower and tub, central air conditioning and refrigerator.

Other amenities include flat panel television with satellite programming, free internet WiFi access available through the hotel in addition to wired high-speed internet drops.

### Other complimentary services

- 3 Swimming pools • Tennis courts • 24 hour fitness centre
- Saunas • Bicycles • Live performances • Business Centre
- Group activities – pool volleyball, aqua-aerobics, tennis, board games, pool games, and so much more (schedule changes daily)

### For the children

- Two children under the age of 12 stay FREE
- Under the age of 4 eat FREE
- Between ages 5 -12 pay ½ price on meals
- Fun activities at Club Cee Cee
- Play Park

**Tel** (868) 660 8800      **Email** info@MagdalenaGrand.com  
**Fax** (868) 660 8503      **Web** www.MagdalenaGrand.com



|                                                                |                                   |
|----------------------------------------------------------------|-----------------------------------|
| <b>Room Category</b>                                           | Deluxe Rooms (Single/Double)      |
| <b>Per Night</b>                                               | US\$ 228                          |
| <b>Check In</b>                                                | 3.00 pm (earlier may be possible) |
| <b>Check Out</b>                                               | 12.00 noon                        |
| Rates inclusive of all taxes and include full buffet breakfast |                                   |

# conference venue

The venue for the Conference is also Magdalena Grand Beach Resort. Participants will enjoy the splendid conference facilities and also the convenience of having their accommodation and the conference at the same location.



# travel

## AIR TRAVEL

ANR Robinson International is the Airport of Tobago. It is served by the following Airlines:

**Caribbean Airlines** from Toronto (Canada) and London (UK)

**Caribbean Airlines** from JFK, Miami, Fort Lauderdale, Orlando (USA)

**American Airlines** from Miami with connections from major US cities

**West Jet** from Montreal and Toronto (Canada)

**British Airways** from London (UK) and from most Caribbean islands

**Virgin Atlantic** to Trinidad or Barbados

**LIAT** and **Caribbean Airlines** from the majority of Caribbean Islands

## SEA TRAVEL

Inter-Island Ferry Service (tickets sold at *Trafalgar Travel*, St. Augustine. Tel 1-868-662-1649)

|             | TT\$ Cost (Return Trip) |                     |                             |                                |
|-------------|-------------------------|---------------------|-----------------------------|--------------------------------|
| Per Person  | Adults<br>\$100.00      | Children<br>\$50.00 | Infants (< 3 years)<br>FREE | Senior Citizens (> 60)<br>FREE |
| Per Vehicle | \$250.00                |                     |                             |                                |

# registration

Registration for the Conference can be done by Post, Fax or E-Mail. Note that registration will only be considered to have been completed on receipt of the appropriate fee.

| REGISTRATION FEES       |                                             |                                              |
|-------------------------|---------------------------------------------|----------------------------------------------|
| (Payable in US Dollars) | Before 31 <sup>th</sup> August 2014<br>US\$ | After 1 <sup>st</sup> September 2014<br>US\$ |
| Members                 | \$250                                       | \$300                                        |
| Non-members             | \$300                                       | \$350                                        |
| Students                | Caribbean                                   | \$150                                        |
|                         | International                               | \$200                                        |

## METHOD OF PAYMENT

Payment of the registration fee can be made by US\$ Bank draft payable to The Caribbean Academy of Sciences at the Republic Bank Limited, UWI Branch, St. Augustine, Trinidad and Tobago. Participants holding T&T Accounts may pay the US\$ equivalent by cheque.

**[ US\$1.00 equivalent is TT\$6.55 ]**

**All registered participants should travel to the Conference with their proof of payment.**

# entitlements of fee-paying participants

In addition to conference literature, payment of conference fees entitles participants to lunch, and snacks served during the refreshment breaks and to attend the Opening Ceremony.

## contact information

Persons planning to attend the Conference are requested to complete the Registration Form and return it to one of the two addresses shown below.

### The Conference Secretariat

c/o Dr. Trevor Alleyne  
Unit of Biochemistry  
Faculty of Medical Sciences  
The University of the West Indies  
Eric Williams Medical Sciences Complex  
Champs Fleurs, Trinidad and Tobago, WI

Tel: 1-868-662-1873/662-9294  
or 1-868-645-2640-9 Ext: 4642/4643  
or 1-868-360-0565  
Fax: 1-868-662-1873  
E-Mail: [trevor.alleyne@gmail.com](mailto:trevor.alleyne@gmail.com)

### CAS Secretariat

c/o Mrs. Carol-Ann Crossley  
Room 1 East, Block 13  
Faculty of Engineering  
The University of the West Indies  
St. Augustine, Trinidad and Tobago, WI

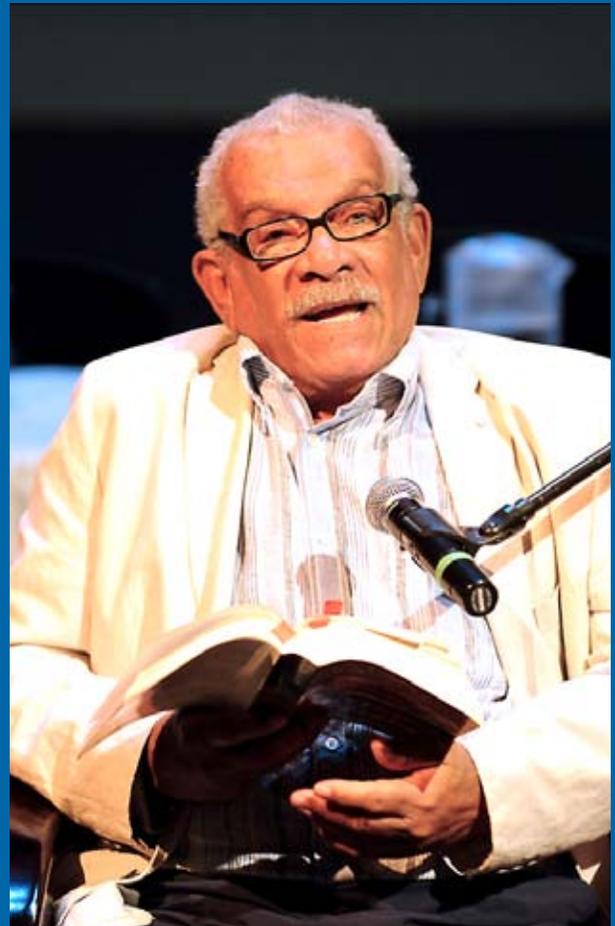
Tel: 1-868-662-2202 Ext. 84469  
or 1-868-793-2351  
E-Mail: [secretariat@caswi.org](mailto:secretariat@caswi.org)

For Conference updates, visit the CAS website: <http://www.caswi.org>

# Pictorial (CAS 2012, Barbados)







**"Mighty Gabby" (Anthony Carter)**

**Nobel Laureate Hon. Derek Alton Walcott**