

Overview of HEP Activities in Sri Lanka



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Technology and Applications
Kathmandu University - June 19th 2017**



Outline

- **Recent initiatives**
- **Road-MAP for Sri Lanka – CERN corporation**
- **Road-Map: Actions Taken**
- **Consortium of Physicists (Experience)**
- **Near future Plans**



Recent initiative

- **EOI signed – June 2015**

The cooperation between Sri Lanka and the CERN was formally initiated in June 2015, following the signing of an 'Expression of Interest' (EOI) Agreement between then Director General of CERN, Prof. Rolf-Dieter Heuer and the Ambassador H.E. Ravinatha Aryasinha

- **ICA signed - Feb 2017**

Minister of Science, Technology and Research, Hon Susil Premajayantha signed the International Cooperation Agreement concerning Scientific and Technical Cooperation in High Energy Physics with CERN Director for International Relations Mrs. Charlotte Lindberg Warakaulle.



Recent initiative

- **Visit of Sri Lankan Delegation – May 2017**

Made a visit to CERN by the first scientific delegation from Sri Lanka comprising 5 Sri Lankan physicists representing Universities. Minister and the Ambassador attended on the first day to initiate the discussion. The programme concluded with a discussion on follow-up actions led by the Ambassador.

Based on the discussion Road-Map for Sri Lanka – CERN collaboration was drafted.

- **Undergraduate students participation at the Summer Programme**

2016 – two students (1 –supported by CERN & 1 – by Sri Lanka)

2017 - four students (2 –supported by CERN & 2 – by Sri Lanka)



Road-MAP for Sri Lanka – CERN corporation

Main Activities of the Road-Map

- 1) Establish a Steering Committee chaired by a Person Nominated by the Minister/Science, Technology and Research**
- 2) Sri Lanka to join the CMS Experiment**
- 3) Visit by CERN delegations to Sri Lanka**
- 4) Periodic Visits of Sri Lankan Scientists to CERN**
- 5) Conference - Kathmandu**
- 6) CERN High School Teachers Programme**



Road-Map - Actions Taken

- 1) **Establish a Steering Committee chaired by a Person Nominated by the Minister/Science, Technology and Research**
 - a) The objective will be to develop physics education in Sri Lanka at the high school and university levels and strengthen cooperation with CERN.
 - b) First meeting Chaired by the Minister was held. Steering committee was identified.
 - c) Two working committees were suggested.
 - WC 1: Popularize Physics Education (Particle Physics in particular)
Strengthen Particle Physics in University Education
 - WC 2: Research Collaboration with CERN (CMS is the option)
Infrastructure development including equipment and data analysis with assistance from CERN



Road-Map - Actions Taken

2) Sri Lanka to join the CMS Experiment

a) Ruhuna University had signed an EOI with CMS in 2006. (Dr. Emmanuel Tsesmelis, Dr. Archana Chama, Dr. John Ellis)

As a result of this: Nadeesha Wickramage completed her PhD at Ruhuna University through TIFR group at CMS as arranged by W.G.D. Dharmaratna. First PhD in HEP from a Sri Lankan University.

b) A Consortium of Sri Lankan Scientists is formed to join CMS.

N. M. Wickramage – Senior Lecturer, University of Ruhuna, Matara

M.K. Jayananda – Senior Lecturer, University of Colombo

D.U.J. Sonnadara – Senior Professor of Physics, University of Colombo

W.G.D. Dharmaratna - Senior Professor of Physics, University of Ruhuna

c) EOI to join CMS was submitted to the last CMS MB.



Road-Map - Actions Taken

5) Conference – Kathmandu

a) **Steering committee approved the participation**

Three Physicists and an Additional Secretary/Ministry of Sci. Tec. and Research are participating.

Minister has proposed to have the next meeting in Sri Lanka.

6) CERN High School Teachers Programme

Working Committee 1 : Will coordinate this activity.

Introduction to Particle Physics to A/L school syllabus has been proposed (will be discussed on 21st June)

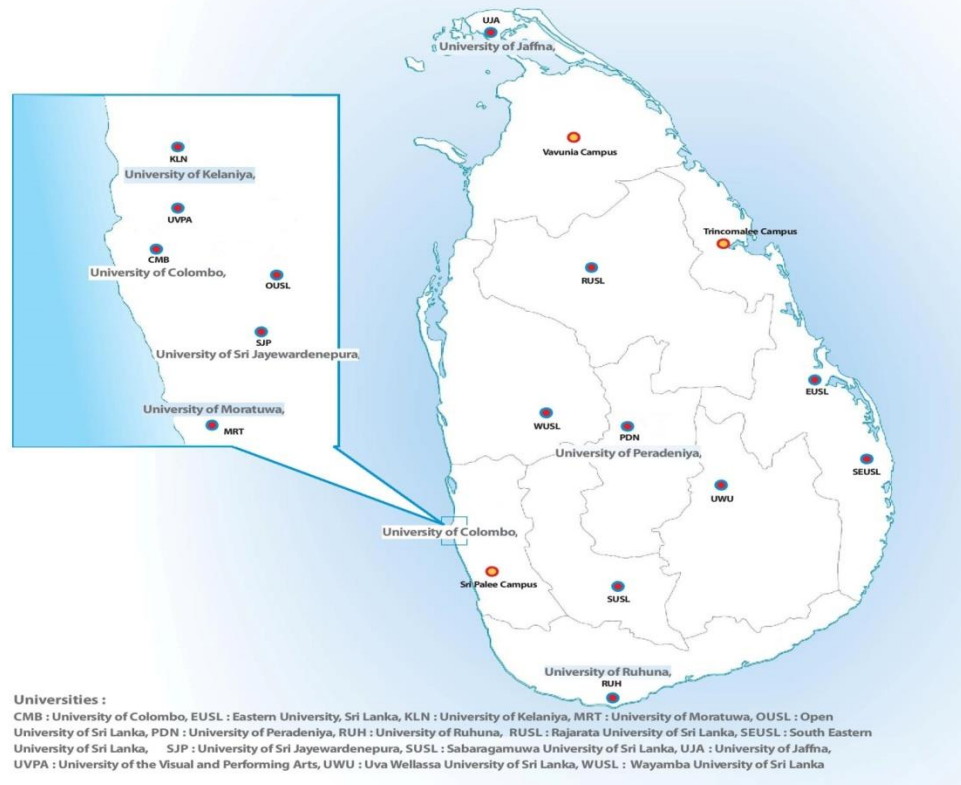
Consortium of Physicists

Depending on the experience in HEP:

University of Ruhuna and University of Colombo will be incorporated initially.

Expect to train young staff members from other universities through CMS.

Higher educational institutions coming under the purview of the UGC



University of Colombo



The oldest University in Sri Lanka, the University of Colombo which is clearly distinguished by its icon the University tower, was formed with the advent of the University College in Colombo in 1913. It continued in the same location with the establishment of the University of Ceylon in 1942.

University of Ruhuna



- The University of Ruhuna was established by a Special Presidential Decree on 1st September 1978, as Ruhuna University College, obtained the University status in 1985, fulfilling a long cherished desire of the people of Southern Sri Lanka.

Core Team - Involvement in HEP



- **Prof. W.G.D. Dharmaratna**
- **Senior Professor and Chair of Physics, University of Ruhuna**
- **PhD (in 1989) from Tufts University based on QCD calculations of Transverse Polarization of quarks and of Λ - hyperons. He joined FSU group in D0 (3 and 1/2 years at FNAL) experiment to work on EM end-cap calorimeter test beam. Has studied the resolution and provided the weighting factors for electron reconstruction in D0 end-cap. Also has studied the muon response. Developed the shower library for fast simulation of D0 and studied the effect of dead material on the calorimeter resolution. Again he has worked with CMS group at FSU (2004/2005) on MC data generation at FSU cluster and analyzed SUSY MC data with Harrison Prosper.**

Core Team - Involvement in HEP...



- **Dr. Nadeesha Wickramage (Member of TIFR group)**
- **Senior Lecturer in Physics, University of Ruhuna**

- **Joined the CMS experiment in 2010 through TIFR as a graduate student and completed her PhD at University of Ruhuna based on research at CMS (1st such PhD from a Sri Lankan University in HEP). She has studied the dependence of RPC response on environmental parameters and Quality Control System of RPCs (Cosmic rays test). Also she worked SMPV group and analyzed transverse momentum distribution of Z bosons decaying to dimuons. At present she is continuing CMS work with PdmV group and contribute as the L3 Validation Manager.**

Core Team - Involvement in HEP..



- **Prof. D.U.J. Sonnadara**
- **Senior Professor and Chair of Physics, University of Colombo**
- **Graduated from University of Pittsburgh based on research carried out at E814, a heavy ion collisions experiment at BNL AGS (1988-1992). After graduation he has worked as a postdoctoral research associate for 3 years for BNL heavy ion experiments E814 and E877 (1993-1995). As a postdoc he contributed in designing a hardware tracking trigger to select particles. For a brief period he also contributed for running simulations for GEM experiment designed for the SSC.**

Core Team - Involvement in HEP..



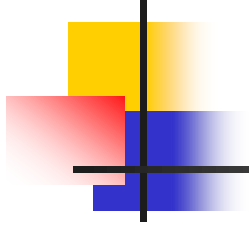
- **Dr. M.K. Jayananda**
- **Senior Lecturer in Physics, University of Colombo**

- **Graduated from University of Pittsburgh based on research carried out at E814, a heavy ion collisions experiment at BNL AGS (1987-1991). Later he has spent one year (1999) with the level 1 calorimeter trigger group of the ATLAS experiment and another year (2009) with the EM calorimeter group of the ALICE experiment. In ATLAS he developed software for testing trigger modules and in ALICE he developed control software for the EM calorimeter.**



Near Future Plans

- **Submit a Five-Year Budget Proposal for the approval of the Cabinet and to include in national budget 2018.**
- **Group is interested in working on Muon/GEM detector. Need to discuss and plan.**
- **Make a presentation at the Collaboration Board.**
- **Interested training postgraduate students through institutes in CMS collaboration in India.**



THANK YOU