

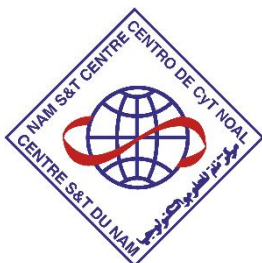
**INTERNATIONAL TRAINING PROGRAM**  
**ON**  
**Lightning Protection: DEFENCE AGAINST**  
**the Killer from the Blue**  
**(A VIRTUAL EVENT)**

**26<sup>TH</sup> AUGUST 2020**

**ORGANISED BY**



**CENTRE OF EXCELLENCE IN HIGH  
VOLTAGE ENGINEERING**  
**UNIVERSITY OF THE  
WITWATERSRAND, JOHANNESBURG,  
SOUTH AFRICA**



**CENTRE FOR SCIENCE & TECHNOLOGY  
OF THE NON-ALIGNED AND OTHER  
DEVELOPING COUNTRIES  
(NAM S&T CENTRE)  
NEW DELHI, INDIA**

## INTRODUCTION

Lightning is a naturally occurring electric discharge caused by electromagnetic field imbalances between clouds and the ground or within the clouds themselves. As a thundercloud (known as Cumulonimbus) matures, colliding particles of rain, ice or snow inside separate charge with opposite polarity. Typically, the positively charged particles reach upper layers of the cloud, and negative charge deposits at the lower layers. As the field strengths exceed certain thresholds, discharge takes place inside the cloud, and a charged channel starts extending towards ground. Usually, such channels carry negative charge. As they approach ground, the objects on ground, such as steeples, trees, people, and the soil or water itself, become positively charged. Those objects send positively charged streamers upwards towards the down coming channel tip. As one of the upward streamers meets the channel from the cloud, a large current flows through the object that sent the successful channel. Then the object is said to be "lightning struck".

A direct strike described above, accounts for only about 3-5% of deaths in developed countries. More deaths and injuries are caused by step potential (40-50%), side flash (20-30%), upward streamers (15-20%), or contact injury (15-20%). Apart from human injuries, lightning leads to property damage, service interruptions, data and signal corruption causing financial losses of many billion USD per year. Sometimes, downtime losses exceed the recovery cost of physical damages. Thus, lightning safety and protection measures may save a fortune for any country that experiences a high density of thunderstorms.

In order to impart basic knowledge on various aspects of lightning phenomena to scientists and professionals of the NAM and other developing countries, the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (**NAM S&T Centre**), New Delhi, India jointly with the Center of Excellence on High Voltage Engineering, **University of the Witwatersrand**, Johannesburg, South Africa announces the organisation of an International Training Program on "**Lightning Protection: Defence Against the Killer from the Blue**" on **26 August 2020**. The event will be hosted by the Centre of Excellence on High Voltage Engineering, University of the Witwatersrand and will be organized in Virtual Mode.

## OBJECTIVES

The Training Program intends to provide basic knowledge on lightning as a scientific phenomenon, threats and risks to the human beings and living environment due to lightning, protection of buildings and equipment, lightning safety of underprivileged communities and low cost protection measures. The development of lightning protection and earthing related business models at Small & Medium Entrepreneurship (SME) level will also be discussed. For the non-profit-earning organizations, a briefing will be given on how to develop and sustain lightning safety education, advisory and research centers in developing countries giving examples of success and failure stories. The secondary objective of this program is to strengthen the already established informal platform for those who are interested in lightning safety promotion and protection engineering and thunderstorm research, as a result

of previously pioneering events in several countries organized by the NAM S&T Centre.

## **TOPICS TO BE COVERED**

The following key topics would be discussed during the Virtual Training Program:

- ❖ Understanding the phenomena of lightning
- ❖ Lightning accidents and levels of risk
- ❖ Introduction to international/national lightning standards
- ❖ Basic concepts of structural protection and earthing
- ❖ Protection of low voltage power systems
- ❖ Protection of signal and data systems including shielding and bonding
- ❖ Lightning safety and education
- ❖ Low cost solutions for lightning protection
- ❖ Lightning protection as a small and medium scale entrepreneurship
- ❖ Development of Lightning Centres

## **IMPORTANT DATES**

<b>Date of the Program</b>	<b>26<sup>th</sup>August 2020</b>
<b>Submission of Application Starts</b>	<b>15<sup>th</sup>June 2020</b>
<b>Last Date for Submission of Application</b>	<b>20<sup>th</sup>July 2020</b>
<b>Confirmation to Selected Applicants</b>	<b>27<sup>th</sup>July 2020</b>

## PROGRAMME

A tentative program of the event is given below:

Date of Program: 26 <sup>th</sup> August 2020		
<i>Time</i> SA Time (GMT+2)	<i>Theme of Training</i> <i>Lecture</i>	<i>Resource Person</i>
9.30 – 10.00	Inauguration and Introduction	Dr. Amitava Bandopadhyay / Prof. Chandima Gomes
10.00 – 10.30	Fundamentals of Lightning	Dr. Shriram Sharma
10.30 – 11.00	Lightning Accidents and Risk Levels	Mr. Ron Holle
11.00 – 12.00	Structural Protections	Mr. Alexis Barwise
12.00 – 13.00	Protection of LV and ELV Systems	Prof. Chandima Gomes
13.00 – 14.00	BREAK	
14.00 – 14.30	Lightning Safety Education	Prof. Mary Ann Cooper
14.30 – 15.30	Entrepreneurship and Development of Training Centres	Prof. Chandima Gomes
15.30 – 16.30	Discussion and Concluding Remarks	Panel of all Speakers

*The Participants of the Virtual Training Program will receive a Participation Certificate electronically.*

## ABOUT THE ORGANISERS

### NAM S&T CENTRE

The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (*NAM S&T Centre*; [www.namstct.org](http://www.namstct.org)) is an Inter-governmental Organisation with a Membership of 47 countries spread over Asia, Africa, Middle East and Latin America. The Centre was set up in 1989 in New Delhi, India to undertake a variety of programmes, including organisation of workshops, symposiums and training courses and implementation of collaborative projects. It also offers short-term *Research Fellowships* to scientists from developing countries in association with the *Centres of Excellence* in various countries. The Centre also brings out technical books and other scientific publications in different subjects of interest to developing countries. The Centre's activities provide opportunity for scientist-to-scientist contact and interactions; familiarising participants on the latest

developments and techniques in the subject areas; identification of the requirements of training and expert assistance; locating technologies for transfer between the members and other developing countries, and dissemination of S&T information etc. In addition, the Centre encourages Academic-R&D-Industry interactions in the developing countries through its *NAM S&T-Industry Network*.

### **UNIVERSITY OF THE WITWATERSRAND, CENTRE OF EXCELLENCE ON HIGH VOLTAGE ENGINEERING**

The University of the Witwatersrand, Johannesburg (<https://www.wits.ac.za/>) is a multi-campus South African public research university, situated in the northern areas of central Johannesburg. It is more commonly known as Wits University or Wits. The university has its roots in the mining industry, as do Johannesburg and the Witwatersrand in general. Founded in 1896 as the South African School of Mines in Kimberley, it is the third oldest South African university in continuous operation. The 2017 Academic Ranking of World Universities (ARWU) places Wits University, with its overall score, as the highest ranked university in Africa. Wits was ranked as the top university in South Africa in the Center for World University Rankings (CWUR) in 2016. For a long period, Wits has been one of the highest ranked universities in the African continent. The Centre of Excellence on High Voltage Engineering, is a key research unit within the Faculty of Engineering and Built Environment at Wits University, dedicated to a wide spectrum of electrical engineering subjects including high voltage and discharge engineering, power system protection, lightning protection, grounding and bonding, and energy security.

## **PARTICIPANTS**

Young researchers, scientists, government officials and policy makers, and representatives from industry and non-government organizations - who are engaged in lightning science research and lightning protection programs are invited to participate in this Virtual Training Program. The combination of participants from various developing countries will allow for exchange of knowledge, ideas and experiences as well as opportunities for global networking and collaboration.

## **RESOURCE PERSONS**

The Training Programme would be designed and coordinated by Prof. Chandima Gomes, Director, Center of Excellence on High Voltage Engineering, University of the Witwatersrand, Johannesburg. Other resource persons for the Virtual Training Program will feature eminent experts and professionals with expertise in the relevant fields from South Africa and other countries, as listed below;

- ❖ Dr. Shriram Sharma: Assistant Professor, Tribuvan University, Nepal
- ❖ Mr. Ron Holle, Senior Scientist, VAISALA, USA
- ❖ Mr. Alexis Barwise, Chairman, TC 81 Mirror Committee (IEC 62305), South Africa
- ❖ Prof. Mary Ann Cooper, MD, Director, African Centers for Lightning and Electromagnetics (ACLENet), Uganda and Chicago, USA

## SUBMISSION OF APPLICATION

Scientists, researchers and other professionals desirous of participating in the Virtual Training Program, **except those from South Africa**, should submit their filled-in application **electronically** directly to the NAM S&T Centre (E-Mail: [namstcentre@gmail.com](mailto:namstcentre@gmail.com)) as early as possible, but latest by **Monday, 20<sup>th</sup> July 2020**.

**Applicants from South Africa** should, however, submit their requests directly to the University of the Witwatersrand, Johannesburg (E-Mail: [chandima.gomes@wits.ac.za](mailto:chandima.gomes@wits.ac.za)).

The following documents must be submitted as e-mail attachments:

- i. Filled in Application Form (Blank form **enclosed**)
- ii. A short CV (**maximum two pages; in MS-Word format**) [Format **Enclosed**]
- iii. Opinion (**a short paragraph; in MS-Word format**) how you qualify to participate in the Conference.

## SELECTION OF APPLICANTS

Selection of applicants will be made based on their academic and professional background, and relevance of their current engagements in the field of lightning science and lightning protection. Only a limited number of participants will be selected from various countries in order to ensure organized deliberations and exchange of information and expertise among the participants. Successful applicants will be electronically informed about their selection by **27<sup>th</sup> July 2020**. The details about the virtual platform that will be used for the Training Program and *log-in details* for joining the program will also be communicated to the selected applicants. Other details and terms & conditions for the participation of scientists from various countries will be given to the individual candidates on receipt of their applications.

## **CONTACT DETAILS**

### **NAM S&T CENTRE**

#### **Dr. Amitava Bandopadhyay**

Director General

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**Website:** <http://www.namstct.org>

### **UNIVERSITY OF THE WITWATERSRAND**

#### **Prof. Chandima Gomes**

Chair, ESKOM Power Plant Engineering Institute (EPPEI)-HVAC

Director, Center of Excellence on High Voltage Engineering

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