

# From lightning to climate: a survey of thunderstorm effects on the atmosphere

## Overview

There are approximately 2000 thunderstorms at any given moment on planet Earth, with a global flash rate of ~50 flashes per second. Thunderstorms and lightning are a natural hazard that affects the economy and lives of millions, in a seasonal cycle that is slowly being changed by the warming climate. Modern society depends on electricity for critical services, and so forecasting and monitoring lightning activity is of crucial importance.

The course deals with the electrical structure of the atmosphere and the processes which take place in fair weather conditions and during thunderstorms. The students will get to know the Global Electrical Circuit and its components, as well as study thunderstorm electrification, evolution and dynamics, lightning physics and its chemical and electrical effects. We will focus on the complex relation between lightning and severe weather (hurricanes and flash floods) and emphasize the trends and predictions for future climate scenarios. The role of lightning in the early terrestrial atmosphere and its existence on other planets will be presented. Students will be familiarized with practical aspects of lightning data for real-time and planning applications.

Course participants will learn these topics through lectures and independent learning from on-line resources. We will work on case studies and assignments using real data, in order to stimulate collaborative research between participants.

<b>Modules</b>	<b>A: Theory and observations of atmospheric electricity: September 6 - September 9</b> <b>B: Application of lightning data in research and operations: September 12 - September 15</b> <b>Number of participants for the course will be limited to 15.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>• You are a Graduate or a Masters' students in meteorology, physics or engineering</li> <li>• You are an Official, executive or a manager in disaster and risk management, electrical power supply with background (degree) in the Natural Sciences</li> <li>• You are a faculty member and researcher in a university or a research institution</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:  <b>Participants from abroad : US \$500</b>  <b>Industry/ Research Organizations: Rs 20000</b>  <b>Faculty from academic Institutions: Rs 10000</b>  <b>Students: Rs 5000/-</b></p> <p>The above fees include all instructional materials and on campus wi-fi access. The participants from out of the city limits will be provided with single bedded accommodation on payment basis in double room. Payment be made in form of a DD in the name of 'Finance and Accounts officer, University of Mumbai'</p>

## The Faculty



**Prof. Yoav Yair** is the Dean of the School of Sustainability at the Interdisciplinary Center (IDC) Herzliya in Israel. His research interests include the electrification of dust storms, lightning properties and thunderstorm related phenomena, space weather and climate. In addition to his scientific career in atmospheric physics, Prof. Yair is an expert on ICT and Learning Technologies. With 15 years of experience as developer at the Center of Educational Technology in Tel-Aviv, he moved to be head of the Center for Technology in Distance Education at the Open University of Israel (2004-2009). Until December 2012 he was the Dean of Development and Learning Technologies at the Open University, where he supervised the testing, dissemination and research of various new technologies in higher education, with focus on video, digital books and mobile reading devices. He serves on the board of the Chais Research Center for Learning Technologies at the Open University. From 2012-2014 he headed the national Inter-University Center for Learning Technologies in Israel (MEITAL). Prof. Yair is an experienced speaker, session chair and organizer of numerous professional meetings. He also gives public lectures and popular radio talks on various topics in educational technology, astronomy, earth science and space physics.



**Dr Sanjay Deshmukh** is the Vice-Chancellor and Professor in Life Sciences, at University of Mumbai, India. His research interests are Climate Change impact on biodiversity, ICT for rural development, conservation and sustainable management of plant genetic resources, Environmental economics, EIA of mega-projects, CSR and Ethical management to name a few.