
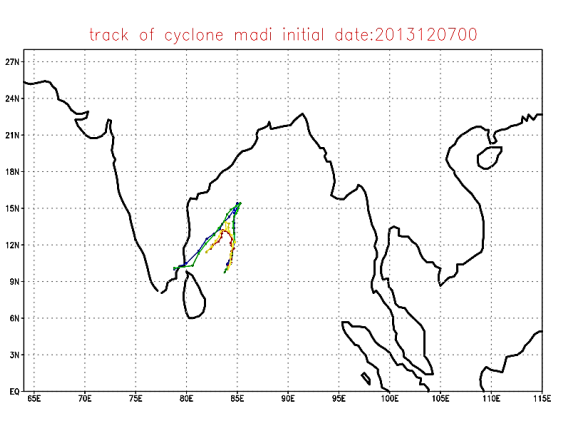

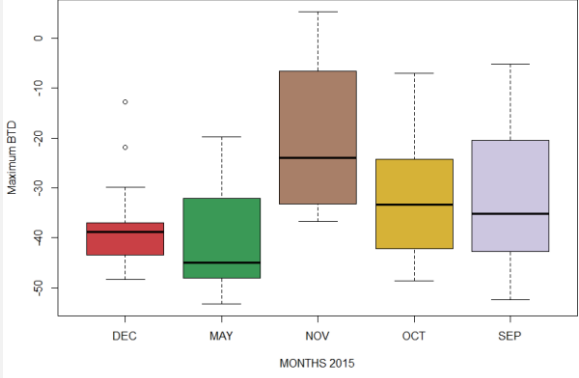

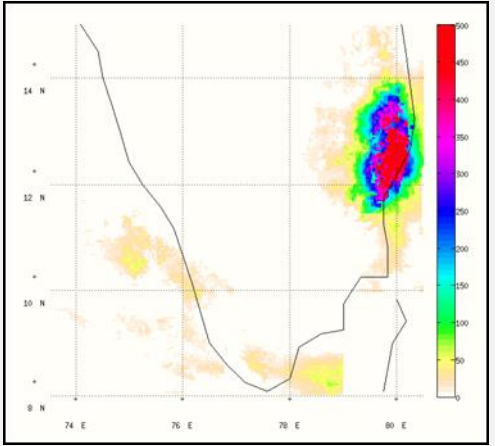



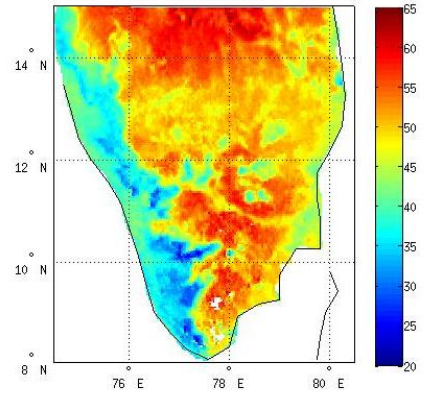
Satellite **M**eteorology and Oce**A**nography **R**esearch and **T**raining


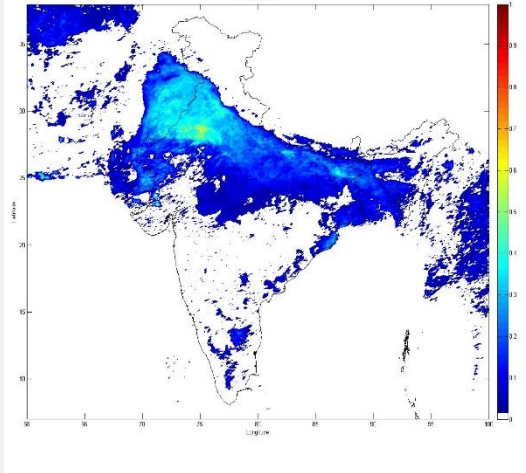
## Summary of the Work Done by Participants as part of SMART Research Initiative


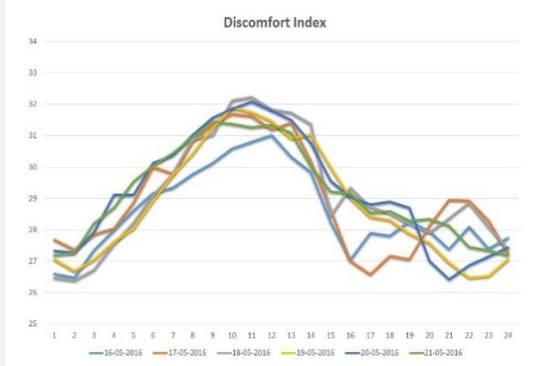
<p><b>Name</b></p>	<p>Ms. Pampi Malakar</p>	
<p><b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b></p>	<p>Department of Physics, Assam University, Silchar Ph.D. Scholar Advance Research Programme Three months</p>	
<p><b>Project Title</b></p>	<p>Indian satellites radiance assimilation in WRF model to study Tropical Cyclones over North Indian Ocean.</p> <p>Impact of Indian satellite radiance data on tropical cyclone track prediction over the North Indian Ocean is studied using numerical weather prediction model (ARW-WRF). Radiance data from INSAT-3D Imager &amp; Sounder and Megha-Tropiques SAPHIR are assimilated using 3D-VAR technique for this purpose. Results from this study have been compared with Indian Meteorological Department and Joint Typhoon Warning Centre best cyclone track data sets. Results from this study are encouraging.</p>	<p>track of cyclone modi initial date:2013120700</p>  <p>Track of the tropical cyclone MADI with (Yellow) and without (Red) assimilation of satellite data. Green and Blue lines show the JTWC and IMD best tracks.</p>


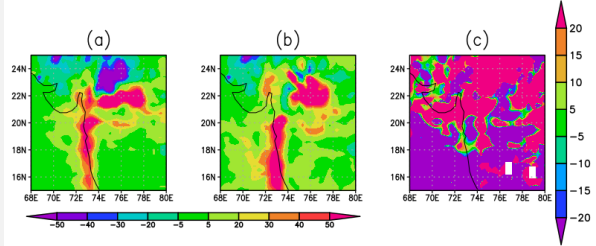
<b>Name</b>	Mr. Aakash Tripathi	
<b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b>	Indian Institute of Technology (BHU), Varanasi B.Tech (Chemical Engineering) III year Data Exploration Programme Two months	
<b>Project Title</b>	<p>A study on overshooting cloud tops over the Indian region using Kalpana-1 VHR data.</p> <p>Occasionally deep convective clouds can overshoot the tropical tropopause (~ 16 km in tropics). In this study, Kalpana-1 VHR data is used to study the occurrence of such overshooting over Chennai and its surrounding for different months of 2015. The brightness temperature difference between WV and IR channels is used as the indicator of overshooting clouds.</p>	<p>Radius 0.2 degree</p>  <p>Maximum BT D</p> <p>MONTHS 2015</p> <p>WV and IR brightness temperature difference from Kalpana-1 satellite, indicating the presence of overshooting cloud tops over Chennai for different months of 2015.</p>

Name	Mr. Kishore Kowtham. I	
Affiliation  Qualification Program Duration	Institute of Remote Sensing Anna University, Chennai M.E. (Remote sensing & Geomatics) Research Initiation Programme One month	
Project title	<p data-bbox="521 657 1330 737">Analysis of winter monsoon rainfall over South Indian Peninsula using INSAT-3D rainfall data.</p> <p data-bbox="521 785 1330 1082">Performance of winter (or Northeast) monsoon in 2014 and 2015 are studied using INSAT-3D derived IMSRA and HE rainfall data sets. Both these data captured the Chennai heavy rainfall event of 1 December 2015 well. These two data sets captured the sub-seasonal variability of winter monsoon rainfall over the South Indian Peninsula very well.</p>	 <p data-bbox="1352 1184 1957 1305"><b>01 December 2015 Chennai heavy rainfall (mm) as observed by INSAT-3D HE rainfall data</b></p>


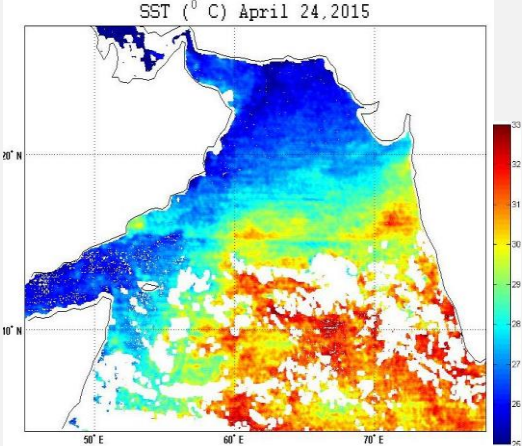
<b>Name</b>	<b>Mr. K. R. Vijay</b>	
<b>Affiliation</b>  <b>Qualification</b> <b>Program</b> <b>Duration</b>	<b>Institute of Remote Sensing</b> <b>Anna University, Chennai</b> <b>M.E. (Remote sensing &amp; Geomatics)</b> <b>Research Initiation Programme</b> <b>One month</b>	
<b>Project title</b>	<b>A study on hot weather condition over Peninsular India in 2016 using INSAT-3D Land Surface Temperature (LST) data.</b>  <b>One month (15 April – 15 May 2016) of INSAT-3D LST data has been analysed to study the hot weather condition prevailed over South Indian Peninsula. LST was considerably higher in the second half of April 2016 when compared to first half of May2016.</b>	 <p data-bbox="1355 1187 1960 1260"><b>Average LST (°C) during 15 April – 15 May 2016 at 1400 IST.</b></p>


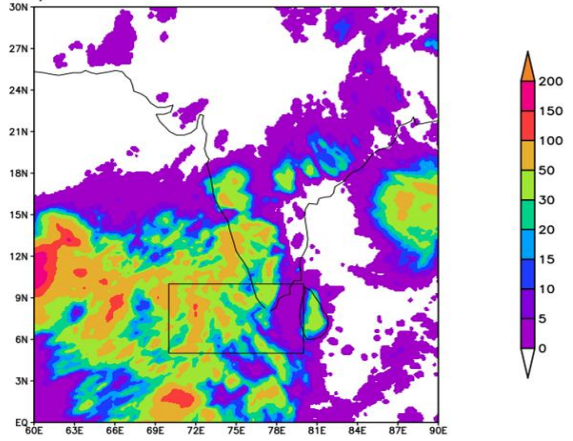
<b>Name</b>	<b>Mr. Piyush Pallav</b>	
<b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b>	<b>Central University of Jharkhand</b> <b>Integrated M. Sc (Applied Physics) 6<sup>th</sup> semester</b> <b>Data Exploration Programme</b> <b>One month</b>	
<b>Project title</b>	<p data-bbox="517 651 1321 727"> <b>A study on spatio-temporal distribution of fog over North India using INSAT-3D data.</b> </p> <p data-bbox="517 786 1321 1161"> <b>Spatio-temporal distribution of fog over North India has been studied using INSAT-3D fog data for two winter seasons (2014-15, 2015-16). Strong year-to-year variability in foggy days and spatial coverage are noticed in INSAT-3D data. Fog coverage was maximum in January 2016 when compared to January 2015. Prevalence of conducive meteorological conditions over North India are attributed for the dense fog condition which persisted in January 2016.</b> </p>	<div data-bbox="1391 651 1915 1153">  </div> <p data-bbox="1355 1161 1955 1238"> <b>Fractional coverage of foggy days for the month of January 2016 at 0430 IST.</b> </p>


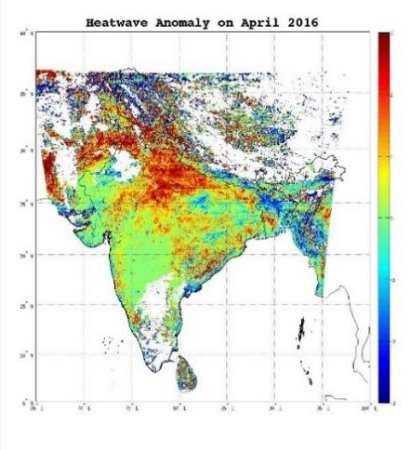
<p><b>Name</b></p> <p><b>Affiliation</b></p> <p><b>Qualification</b></p> <p><b>Program</b></p> <p><b>Duration</b></p>	<p>Ms. Manushi J. Shah</p> <p>Indus University, Ahmedabad</p> <p>B. Arch (8<sup>th</sup> Semester)</p> <p>Research Initiation Programme</p> <p>One month</p>	
<p><b>Project title</b></p>	<p>An exploratory study on Human discomfort over selected Indian cities using ISRO AWS data.</p> <p>Discomfort caused by important meteorological parameters namely temperature and relative humidity has been assessed for 5 major cities across India during the hot weather season of 2016. The ISRO-AWS data are used to compute the Discomfort Index. Among the 5-cities analysed, Dehradun is the most comfortable city throughout the year.</p>	 <p>Diurnal evolution of Discomfort Index over Ahmedabad for different days of May 2016.</p>

<b>Name</b>	Mr. Hiren S. Lekhadiya	
<b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b>	SV – NIT, Surat Ph. D Scholar Advance Research Programme One month	
<b>Project title</b>	<p>Assimilation of INSAT-3D Sounder retrieved temperature and humidity profiles in WRF model: A case study over South Gujarat region.</p> <p>INSAT-3D sounder retrieved temperature and humidity profiles have been assimilated in WRF model to study their impact on heavy rainfall forecast. A case of heavy rainfall that occurred over Gujarat and Madhya Pradesh during 25 July 2015 has been considered for the study. Results suggested positive improvements in 24-hr accumulated rainfall forecast due to the assimilation of INSAT-3D data.</p>	 <p>(a) Control minus GSMaP 24-hr accumulated rainfall [mm] (b) Experiment minus GSMaP 24-hr accumulated rainfall [mm] and (c) Improvement parameter (%).</p>



<p><b>Name</b></p>	<p>Mr. Subrota Halder</p>	
<p><b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b></p>	<p>Indian Institute of Technology, Bhubaneswar M.Sc. (Atmospheric &amp; Oceanic Science) Data Exploration Programme One month</p>	
<p><b>Project title</b></p>	<p>Evolution of Arabian sea warm pool in 2015-2016 using INSAT-3D Sea Surface Temperature data.</p> <p>INSAT-3D derived Sea Surface Temperature data has been used to study the evolution of warm pool in the Arabian Sea prior to the onset of summer monsoon in 2015 and 2016. Present study suggested that the warm pool was stronger in 2016 as compared to 2015. Spatial pattern and intensity of warm pool captured by INSAT-3D match well with that observed by NOAA-OI-SST.</p>	 <p>SST (<sup>o</sup> C) April 24, 2015</p> <p>Sea Surface Temperature (C) showing warm pool over the Arabian sea. Date: 24 April 2015.</p>

Name	Mr. Debojit Sarkar	
Affiliation Qualification Program Duration	Indian Institute of Technology, Bhubaneswar M.Sc (Atmospheric & Oceanic Science) Research Initiation Programme One month	
Project title	<p>Onset and progress of Indian summer monsoon in 2015 as observed by INSAT-3D rainfall data.</p> <p>Four months (June to August 2015) of daily INSAT Multi-spectral Rainfall Algorithm (MSRA) data from INSAT-3D has been analysed to study the onset and further progress of Indian summer monsoon over India. MSRA rainfall indicated monsoon onset on 4 June 2015 which matches well with the onset date declared by IMD. MSRA rainfall data clearly captures the active and break phases of the Indian summer monsoon.</p>	 <p>Arrival of monsoon to Indian west coast as captured by INSAT-3D MSRA data. Date: 4 June 2015.</p>

<p><b>Name</b> <b>Affiliation</b> <b>Qualification</b> <b>Program</b> <b>Duration</b></p>	<p>Mr. Emmanuel Rongmie Indian Institute of Technology, Bhubaneswar M.Sc (Atmospheric &amp; Oceanic Science) Research Initiation Programme One month</p>	
<p><b>Project title</b></p>	<p>Analysis of hot weather condition over North India during April 2016 using INSAT-3D LST data.</p> <p>INSAT-3D Land Surface Temperature (LST) data is used to study the hot weather condition prevailed over North India in April 2016. LST was unusually high during 14-16 April and 25 April in 2016. Likely reasons behind the unusual hot weather condition are advection of hot and dry air from Pakistan/Afghanistan region, clear-sky (sunny) condition and presence of lower tropospheric subsidence.</p>	 <p>LST anomaly (°C) during 14-16, April, 2016 (a hot weather period) over the north-central Indian region at 1400 IST.</p>