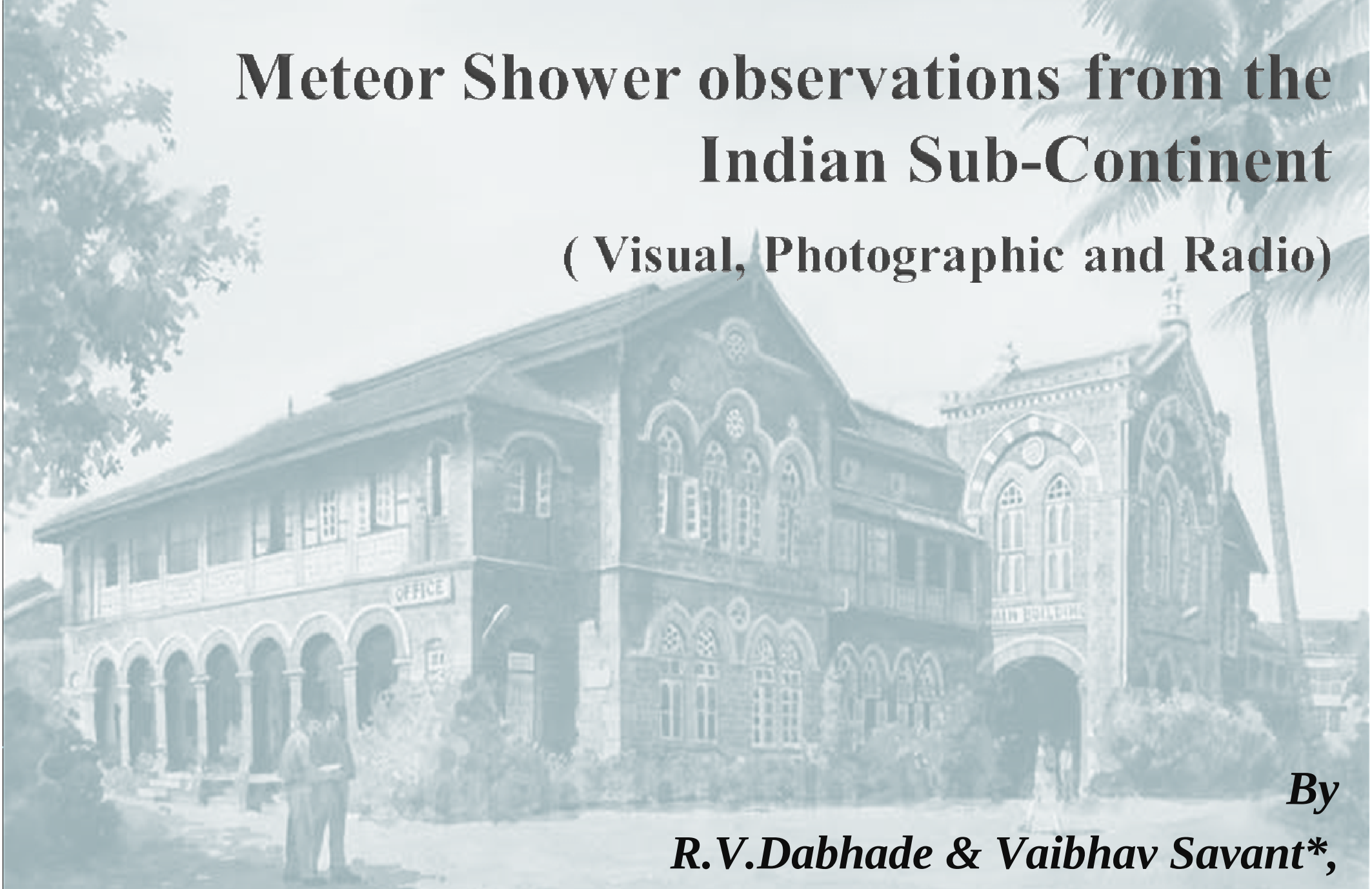
Meteor Shower observations from the Indian Sub-Continent

(Visual, Photographic and Radio)



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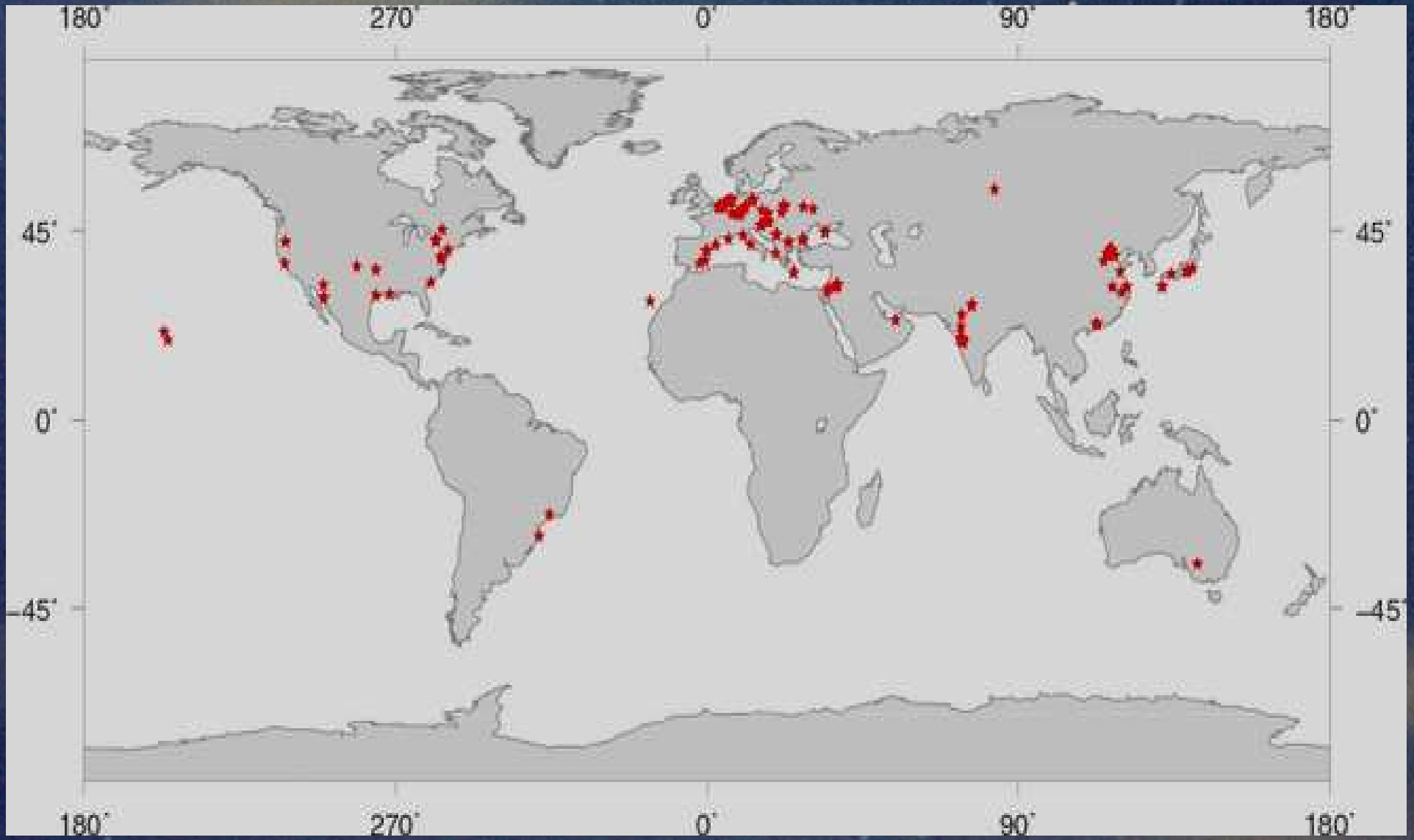
The Indian Sub-continent comprises the countries of India, Pakistan and Bangladesh, it often also includes Nepal , Bhutan , and offshore Sri Lanka and may include Afghanistan and the Maldives.



The earliest record of meteors being observed from India appears in Indian epics as far back 300 BC (Lokanadham 1997).

- Presently meteor shower observation from India is not carried out on regular basis.
- Very few amateur groups observe the showers on and off and send their observations to IMO.
- There is no consistency involved.

- India does not have a good report card so far as light pollution is concerned.
- Apart from light pollution, air pollution also adds to scattering of light.
- In the past few years Monsoon has also been very unpredictable.

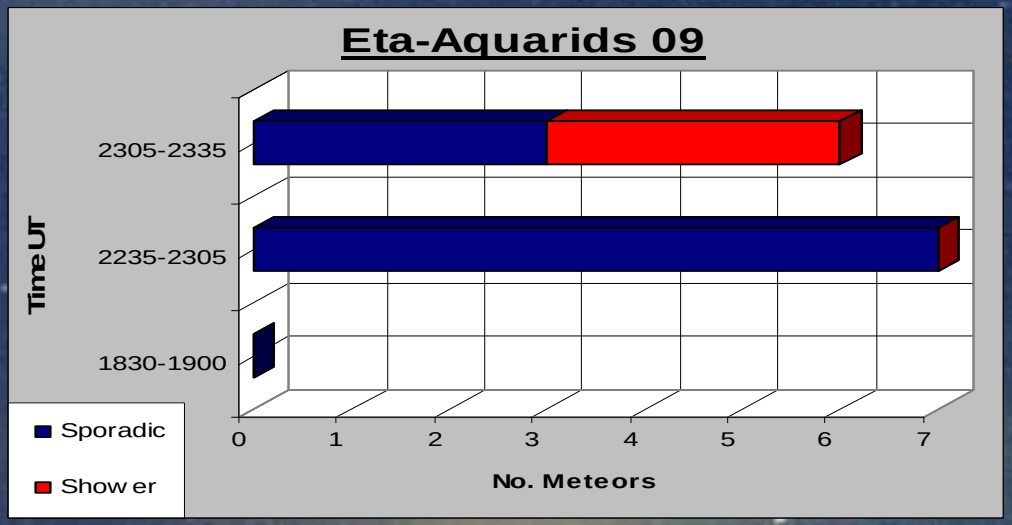
- **The worlds largest megapolis are situated in India (population exceeding 10 million) other major cities have populations in excess of 1 million.**
- **Rapid industrial development, increase in automobile and aerosols emission has led to increase of cloud condensation nuclei.**
- **Total suspended particles in major cities (TSP) Varies from 200-500 mg/m^3 which leads to considerable deterioration in visibility .**
- **Acceptable level of TSP is less than 10 $\mu g/m^3$ and WHO suggests it should no exceed 60 $\mu g/m^3$.**

Reasons:

- Meteor shower observation is not popular in India as in other countries.
- Enthusiastic city observers have to travel long distances for hours to look for suitable sites before observations can be done.
- As this is a group activity all the observers cannot take off from college, work place and be away for three or more days during each shower.

Meteor observation is restricted to fun element with hardly any research involved.

- National Institutes in India do not carry out research in Meteor Science as such and whatever research papers published are from IMO data.
- We in Fergusson College, Pune India have been involved in the activity for the past five years.
- Students are trained in meteor shower observations by senior students.
- Photographic observations were tried last year and we managed to get some trails of the Geminid shower.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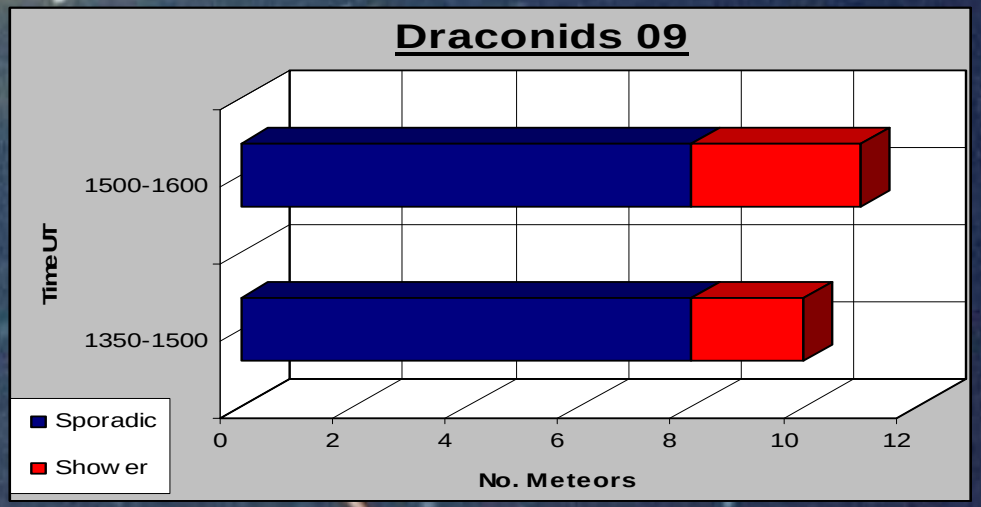
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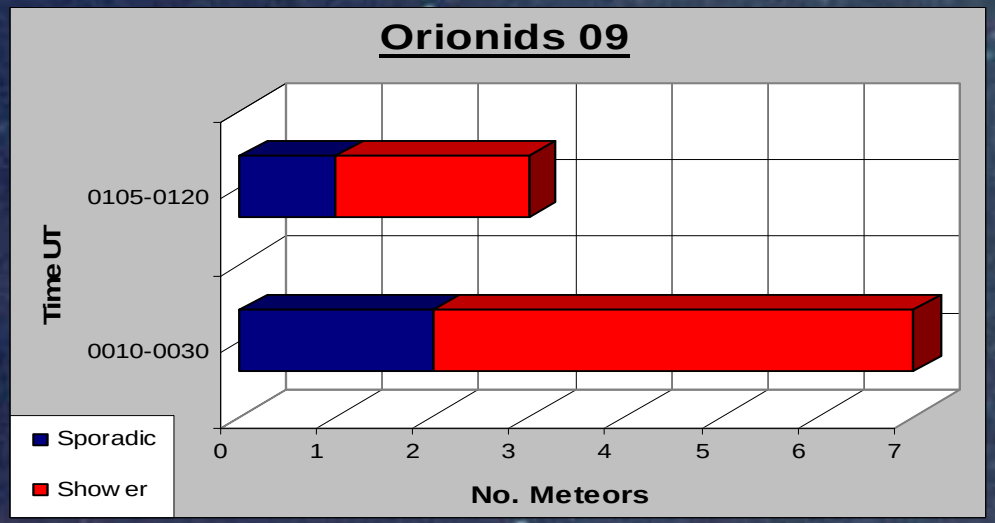
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Phyan cyclone, during the Lenoids

Photographic Meteor Shower Observations were carried out using:

- DSLR Canon 50D.
- Initially with 18-55 mm normal lens.
- Later 10-22 mm wide angle lens was used.
- Exposures from 10 seconds to 60 seconds were tried.

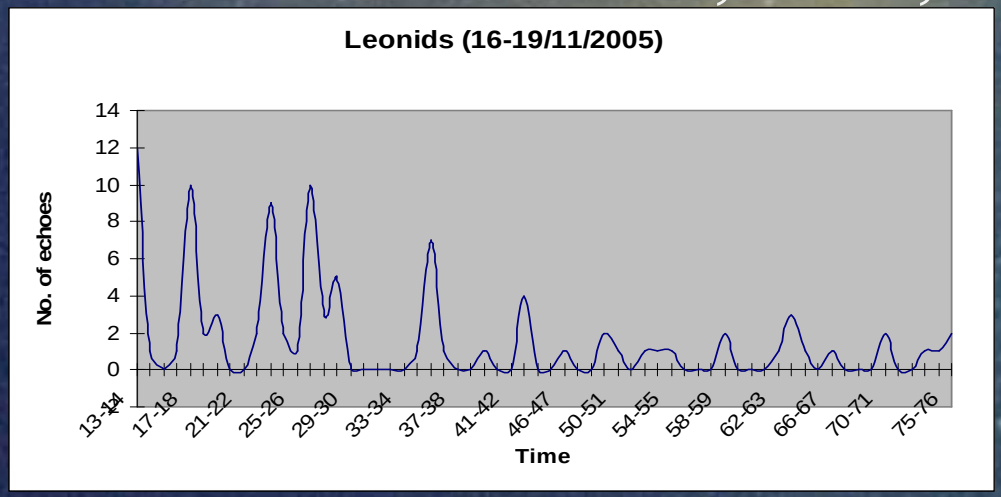
- **Problems:**

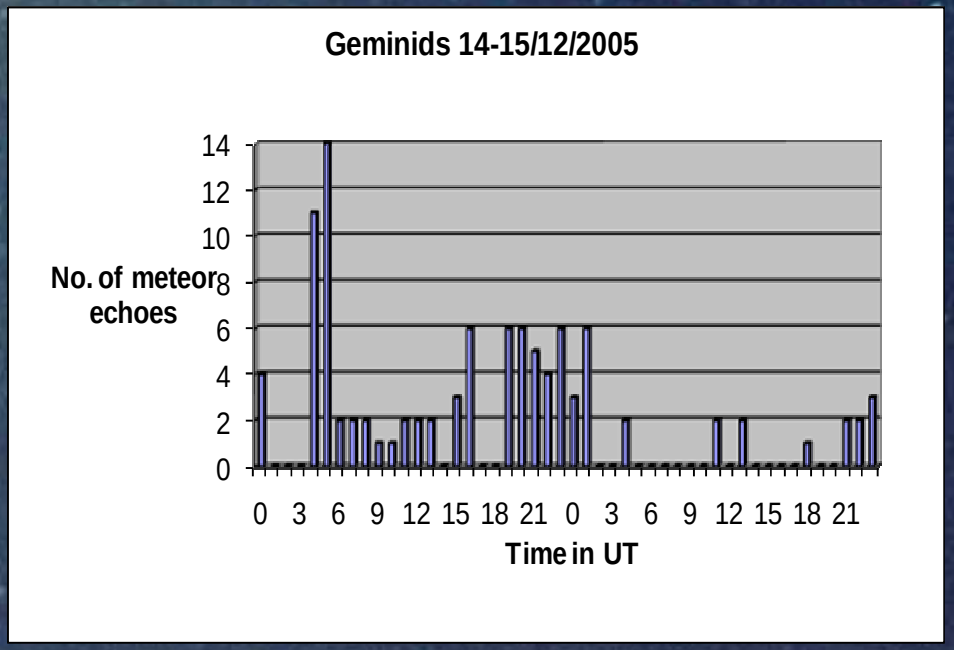
- **No first hand guidance is available for improving the techniques - Visual or Photographic.**

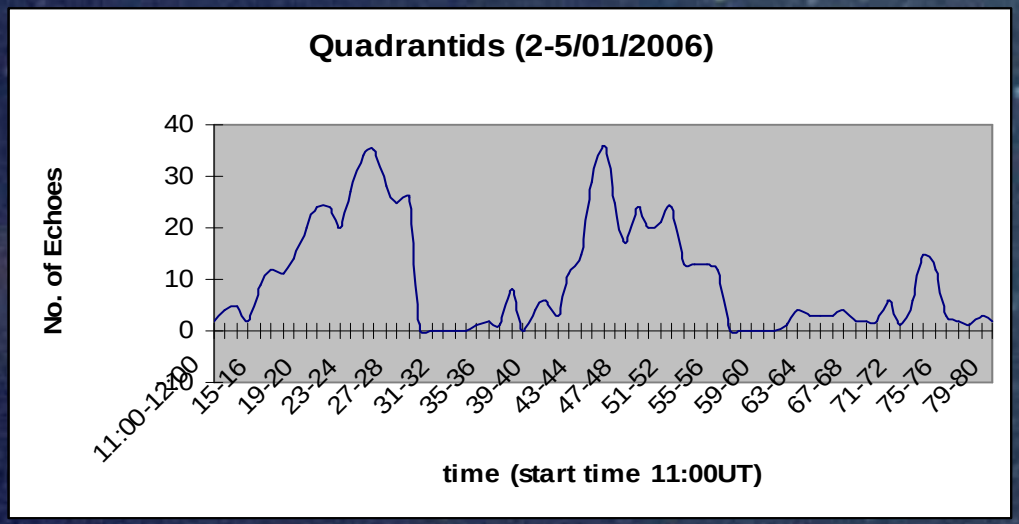
- **Trained students leave after graduating and the group no longer exists.**

Due to visibility problems, we switched to Radio meteor shower observation method.

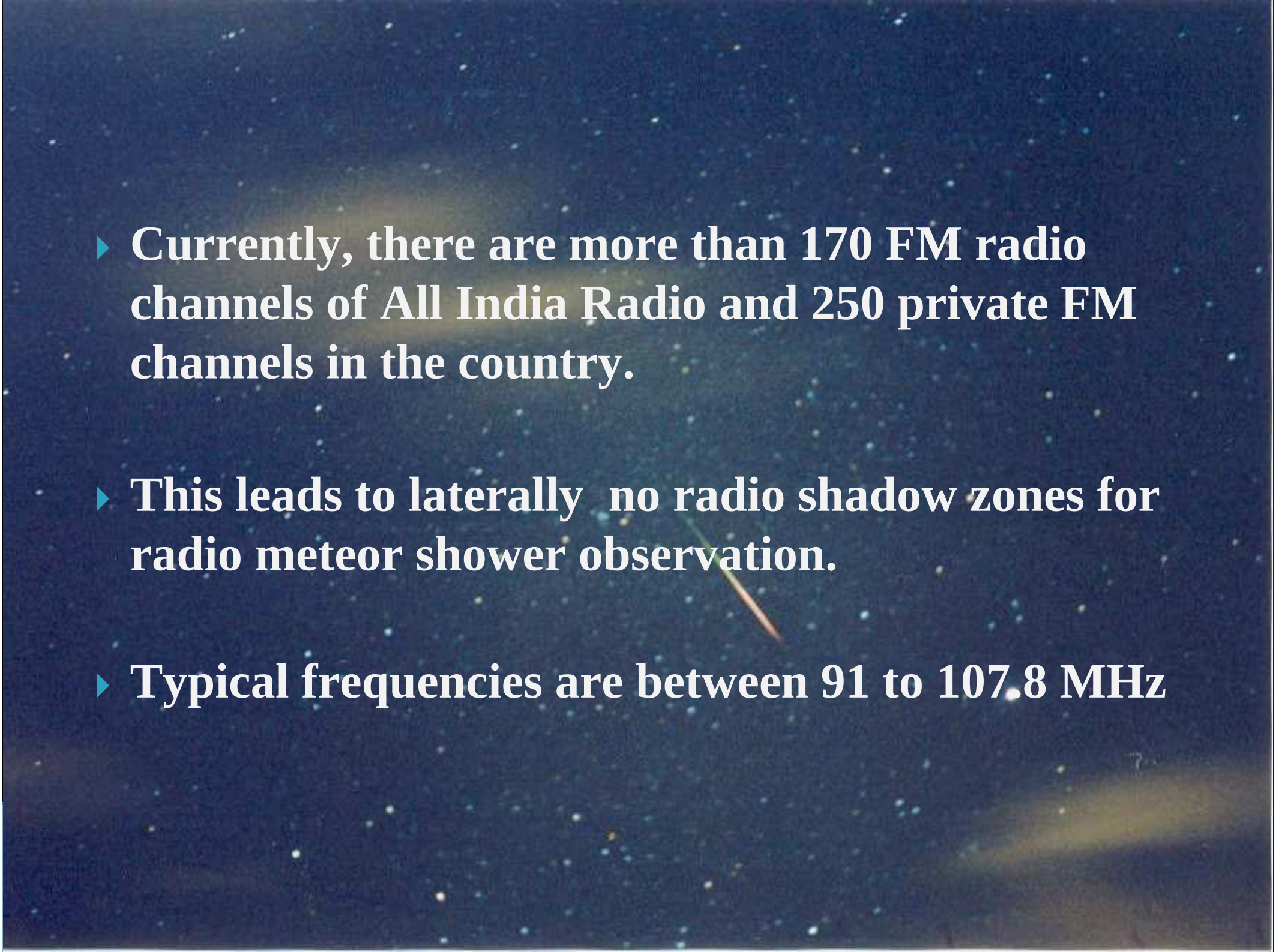
- We succeeded in taking observations from various places in India – Ahmedabad, Jalna, Manmad and Nagpur.







Central Meteor Observation Station - CMOS



- Currently, there are more than 170 FM radio channels of All India Radio and 250 private FM channels in the country.
- This leads to laterally no radio shadow zones for radio meteor shower observation.
- Typical frequencies are between 91 to 107.8 MHz

- **Looking at this scenario we are presently involved in trying HAM radio/ Airband Radio for Meteor shower observations.**
- **HAM in India is currently only used for disaster management.**

We have Astronomy & Astrophysics as optional subjects at UG and PG level and students are encouraged to carry out projects in this area.

- We have recently taken part in the International Asteroid Hunt.
- Students have also carried out projects on the Lonar Meteoritic impact crater which is the only hyper velocity crater in basalt rock.
- The crater is 170 Km from Pune (3 hrs)
- As we have large student pupulation we hope to do some collaborative work in meteor observations from India.
- We have an Astro-Club which has been engaged in Astronomy popularization for the last 11 years : Seminars, Star gazing, Meteor shower observations, Eclipse observations, Saturday lecture series.

Lonar Lake (impact crater) has a mean diameter of 1.2 kilometers and is about 137 meters below the crater rim. The meteor crater rim is about 1.8 kilometers in diameter

Annular Solar Eclipse. 15th January 2010, Varkala, Kerala.


Thank you