## **TULIP Landmark finding the Latitude and Longitude** manually

Most of the Tulip landmarks are actually also PingER monitoring hosts. Almost every PingER Host in the NODEDETAIL database has very useful information e.g. Node Name, URL, Full Name of the node etc. If you have to find the Geographic coordinates manually then this information proves to be very useful. You have to follow the following steps to find Latitudes and Longitudes using Google Map or the following link: <a href="https://www.satsig.net/maps/lat-long-finder.htm">www.satsig.net/maps/lat-long-finder.htm</a>.

- 1. Find the host's site:
  - a. You may have visited the site and be able to identify it on a map.
  - b. or, copy the URL from the NODEDETAILS database, paste it in your web browser. Go to the landmark's site and look for the site's address (steet address, city etc.). You may find this under 'Contact us' link or see the bottom of the page to find the site's address.
  - c. or suppose you do not have a URL then use Node Name/Full Name from NODEDETAIL database to find some web site for that landmark's site. If you find the web site, then do same as explained in Step b.
  - d. if there is no web site listed for that node then use the NODEDEATILS city information (and of course the address if it is available)
  - e. if you do not find an entry in the NODEDETAILS database for the desired node, then use the name of the node to find the full name or city of the node using Google help.
- 2. Once you have the location information (e.g. site name, street address), find its coordinates on Google map or through the link given above.
- 3. On the other hand if you have a contact at the landmark's site or there is a contact entry in the NODEDETAILS database, you can contact (e.g. by email) the Contact Person of the host by email to request the Latitude and Longitude.
- 4. Sometimes the lat-long-finder will recognize the site's official name (especially for big establishments such as universities or national labs) and point you to it.
- 5. If it is a PlanetLabs site you may be able to deduce the location from https://www.planet-lab.org/db/pub/sites.php.
- 6. You may also use Geotools to see if it can assist.

## Results

We have applied these methods to find Geographical coordinates of the PingER type landmarks. By using manual methods, we have updated the coordinates of 14 PingER nodes successfully. We have used manual approach because either there was no contact person in our database or someone among us has already visited that site. Similarly we had sent the mails to the contact persons of other PingER nodes and we have updated the coordinates of 19 PingER nodes. Now we can say these coordinates are correct witin a radius of few meters.

A detail list of nodes, their coordinates and method used is attached. List of Nodes

The locations of the landmarks can be viewed via the TULIP map.