

The Toilet Roll Challenge!

Here's an interesting Citizen Science project concerning light pollution that I'd like you to help me with... I'm hoping to roll it out more generally as a Citizen Science project over this lock-down period, so I'd appreciate some input to check my calculations. Your location is one for which I have some alternate measurements of sky quality which I can use to calibrate the star count measurements.

All you need to complete the survey is a clear sky and a toilet roll core(!) – instructions are below.

If you can help, I'd appreciate it – submit your results through the web page. If you've any questions you can contact me at: brian.espey@tcd.ie

Thank you in advance!

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Instructions:

- About 11pm (i.e., after the end of astronomical twilight) I'd like you to go outside and make some measurements. (For town or city locations, after 10pm should be ok).
- Go to an area away from direct light, e.g. when you are out for exercise and allow some time to accommodate to the (relative) darkness (you might notice seeing some more fainter stars if conditions are good). If you need glasses for distance vision, don't forget to use them...
- Using a toilet roll core, point to at least 5 directions (zenith plus another four at approximately 45 degrees altitude, e.g. zenith, N, S, E, W (fill in the intermediate points, i.e. NE, SE, SW, NW if you have time). As a guide, if you're unsure about where 45 degrees is relative to your horizon (e.g. if it's obstructed), if you can see the Pole Star, place that just above the field-of-view of the tube, and you'll be at approximately the correct angle.
- For each position, let your eye roam around the field-of-view and note which stars you definitely see, and which you appear to see most of the time (i.e., are near the limit). If there are clouds in that direction, just skip and move on to the next area.
- Write down the date and time together with a brief note of the conditions (e.g. whether any haze), and provide the star counts against each position.
- Check the dimensions of the toilet roll core (diameter and length) just to confirm that the dimensions are similar to Tesco ones (37mm internal diameter by 110mm long).
- The site where you took your measurements needs to be recorded - for this we use the Central Statistics Office Small Areas which are designed to anonymise the location while still providing useful data for the project. You can obtain a code for this area by using the CSO

site. Go to: <http://census.cso.ie/sapmap/> and you will see a list of possible boundaries listed alphabetically in a menu on the right-hand side. Select “small areas” to select the census Small Area boundaries. At the top left you will see a push-pin which you can click to locate your area and you can move and zoom around the map to reach the correct spot. Once there click inside the boundary containing your site, then right-click and you will be provided with a numeric code. For example, the reference for the Phoenix Park is **268118001**

- Go to the website: <https://tinyurl.com/TRoll-challenge> and enter your measurements. If you couldn't see towards a particular direction, or missed taking a measurement, just leave that direction blank (It's important that you DON'T enter a zero).

View of sky looking towards the North at 11pm during Dark Sky Week – the North Star is visible near the centre of the image →

Adapted from:

<https://www.heavens-above.com/skychart2.aspx>

