

STARS4ALL, a Light Pollution Awareness project

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Abstract

STARS4ALL is a collective awareness platform for promoting dark skies in Europe, funded by the EU. Our project aims at representing the right of dark and starry skies or 'stars for all the citizens'. We intend to involve citizens within the offered Light Pollution Initiatives (local or global open working groups who fight against the negative impacts of artificial light at night) and also to help them to create their own.

1 Introduction

STARS4ALL is a collective awareness platform for promoting dark skies in Europe, funded by the European Union H2020-ICT-2015. Research and Innovation¹. Our project aims at representing the right of dark and starry skies or stars for all the citizens.

We intend to involve citizens within the offered Light pollution initiatives (local or global open working groups who fight against the negative impacts of artificial light at night) and also to help them to create their own.

The partners in the consortium are: Universidad Politécnica de Madrid, Universidad Complutense de Madrid, and Instituto de Astrofísica de Canarias in Spain, Cefriel (Italy), University of Southampton (UK), the Leibniz Institute of Freshwater Ecology and Inland Fisheries (Germany), ESCP Europe, and the European Crowdfunding Network.

¹www.stars4all.eu

2 Light Pollution Initiatives

Light pollution initiatives (LPIs) are local or global working groups who fight against the negative impacts of artificial light at night. The community is open to everyone, not only researchers but interested citizens. STARS4ALL is an example of citizen science. STARS4ALL is a nursery of initiatives. We begin with a few but we intend to grow in the next years.

Table 1: First Light Pollution Initiatives

LPI #	Name
1	Broadcasting Events
2	European Sky Protection Initiative
3	European Quality Seal (QS)
4	Detecting Inefficient outside Lighting
5	Detecting Inefficient Inside Lighting
6	European Photometer Network
7	Cities at Night project
8	Empower Citizens Actions
9	Light Pollution Outreach
10	Loss of the Night application

More light pollution initiatives has been added as the LPI11: 'My Sky at Night' that uses the Loss of the Night app, the 'LoNNe intercomparison campaign' (LPI12) to compare and calibrate night sky measurement devices [1].

We plan to extend this spanish NixNox project [2] (promoted by SEA) to find and characterize places to enjoy the starry skies, to european countries using the STARS4ALL platform as LPI13.

3 European Photometer Network

Interested citizens will help us in monitoring the light pollution of European villages. The light pollution initiative 'European Photometer Network' will extend the current existing professional photometer networks to a citizen-based network of photometers.

The aim is to extend the photometer network ² of the Spanish Light Pollution research network ([4]) to european countries. We plan to joint efforts with other networks in Europe with similar monitor stations (Italy, Switzerland, etc). The data collected will be archived in open repositories.

The spanish network operates with commercial SQM photometers. We are developing low cost devices that could measure night sky brightness [5]. The citizens, asociactions, and

²<https://guaix.fs.ucm.es/splpr/SQM-REECL>



Figure 1: Internal view of the TESS-V1 night sky brightness photometer inside the weather proof box. The light collector with the infrared rejection filter (in blue) lies over the electronic PCBs.

schools will be able to purchase and install low cost night sky brightness photometers, which will be sold in the STARS4ALL marketplace.

4 Night Sky brightness photometer

We have designed TESS-V1 (see Figure 1) to monitor the sky from fixed places and every night. It is the first version of a series of cheap but reliable photometers that will be used to measure night sky brightness. TESS communicates to a router via WiFi and it sends automatically the measurements to our data repository using IoT (Internet of Things) protocols. It also measures the sky temperature to estimate the cloud coverage. The software, hardware and data will be open.

5 Cities at Night

The initiative LPI6 'European Cities at Night' is the continuation of a successful citizen project to recover pictures taken by astronauts onboard the International Space Station that

could be used for scientific purposes [3]. The citizens helped us to classify thousands of images of the Earth at night to be used for light pollution research³.

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³www.citiesatnight.org