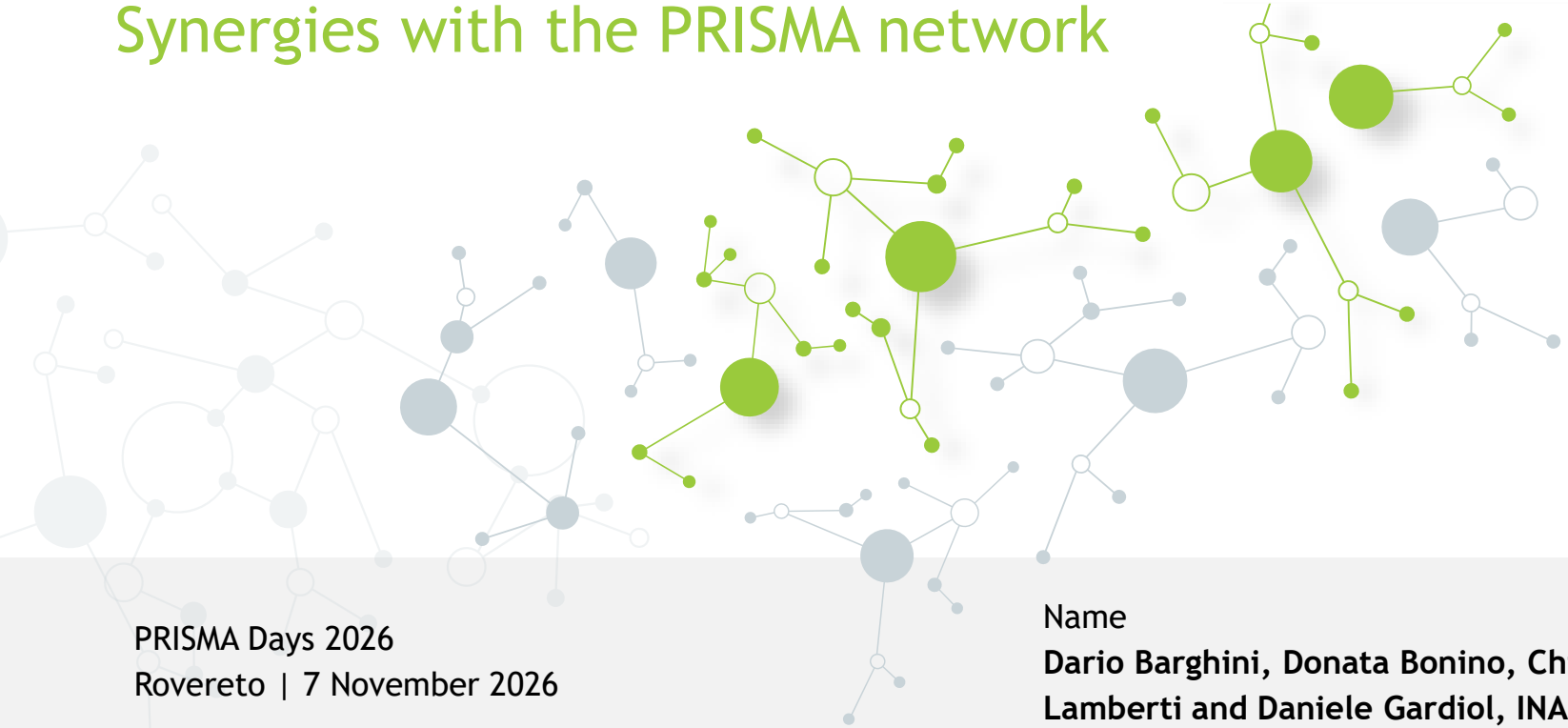
DARKERSKY4CE Photometer Network

Synergies with the PRISMA network

Interreg CENTRAL EUROPE

Co-funded by the European Union

DARKERSKY4CE



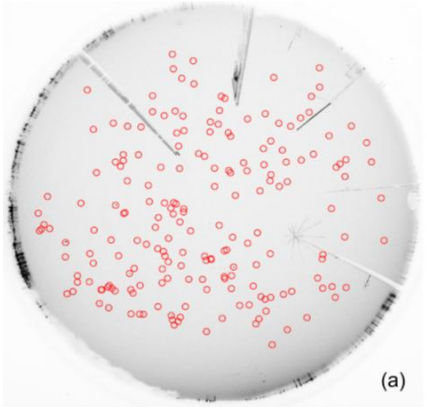
PRISMA Days 2026
Rovereto | 7 November 2026

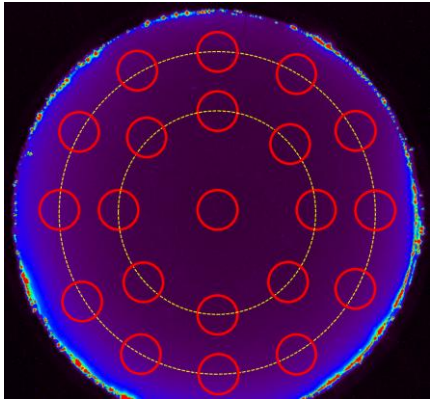
Name
Dario Barghini, Donata Bonino, Chiara Lamberti and Daniele Gardiol, INAF - OATo

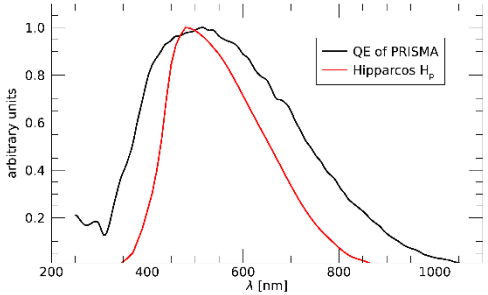
PRISMA CALIBRATION DATA

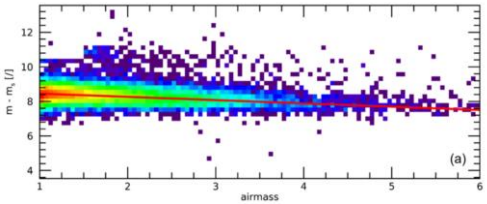
Measurement of the Night Sky Brightness

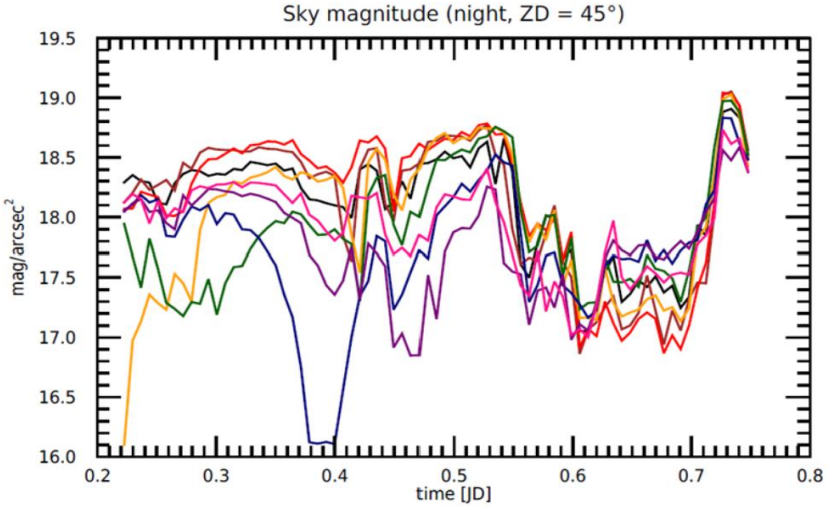
- Continuous flow of **5 s exposure images**
- Automatically analysed by the PRISMA central server (INAF - Trieste) in order to perform **astrometry and photometry calibrations**
- Photometry suffers from heavily **interlined CCD and CMOS**, though not a problem for sky background measurements







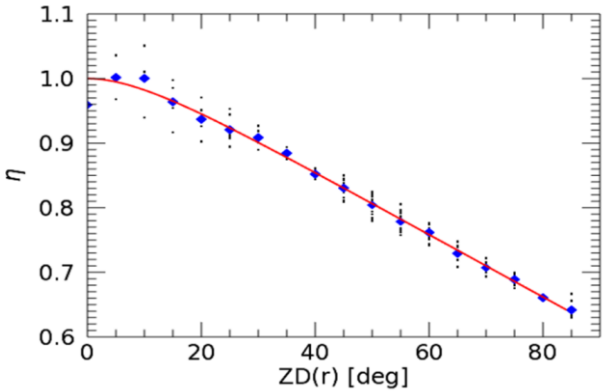


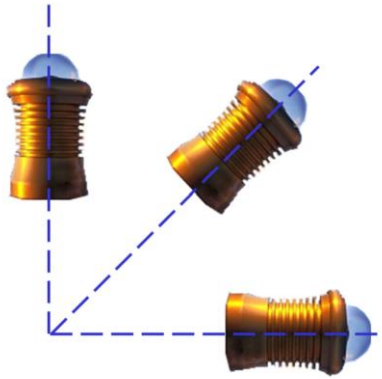


FISH-EYE OPTICS CALIBRATION

On-field tests for spatial uniformity

- Within the standard pipeline, we measure the sky brightness at z = 0°, 45° and 70°
- Dedicated on-field tests carried out in 2018 to test for the **uniformity of the response** of the optic and sensor
- All-sky camera mounted in **alt-az configuration**, observing the **same portion of the sky** with the camera **pointed in different directions**



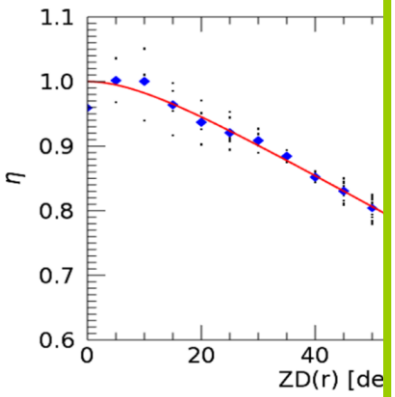


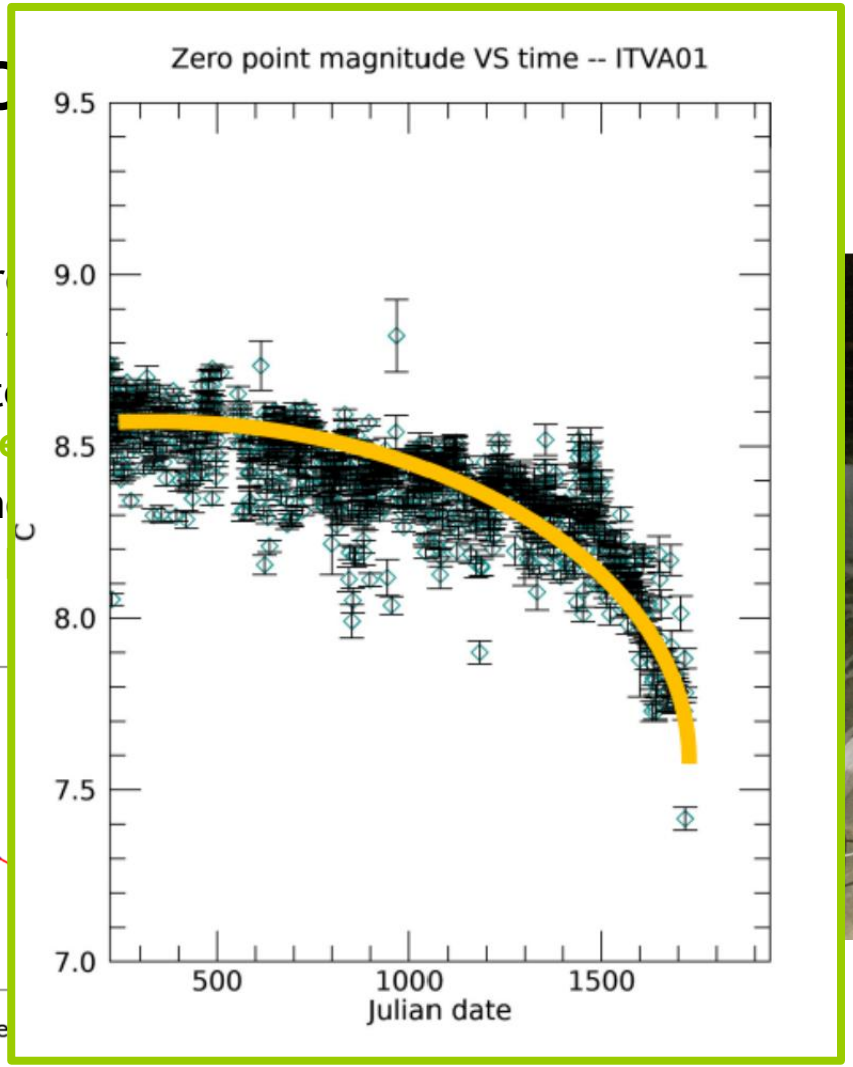


FISH-EYE OPTIC

On-field tests

- Within the standar
  brightness at z = 0°,
- Dedicated on-field t
  the **uniformity of the**
- All-sky camera m
  observing the **same**
  pointed in different





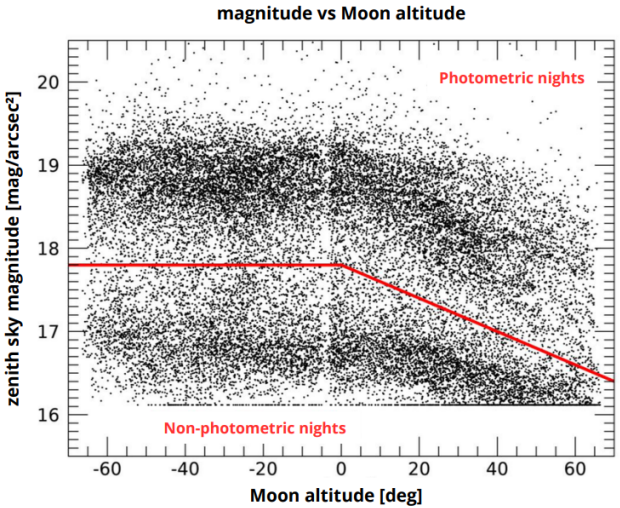


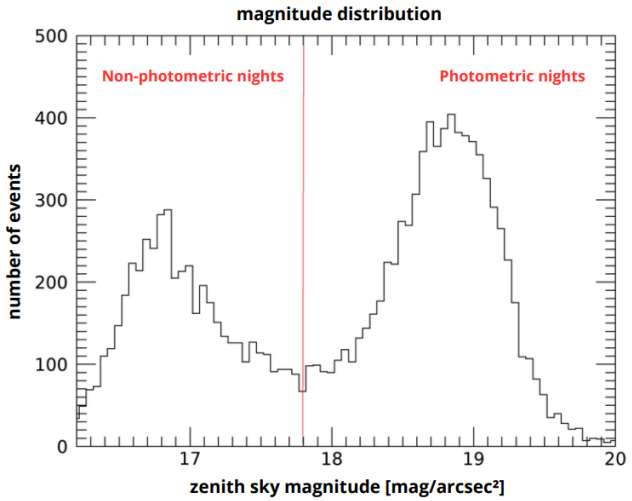
PRISMA CALIBRATION DATA

Preliminary Analysis

- First analysis of the night sky brightness at the zenith **as a function of the Moon elevation** in all weather conditions
- Clear distinction between the **two populations** of photometric and non-photometric nights

Results from **ITPI01**





PRISMA CALIBRATION DATA

Preliminary Analysis

- Study of the night sky brightness at the zenith as a function of the Moon altitude for varying Moon phases

$$m = P_0 + P_1(\phi) \cdot h$$

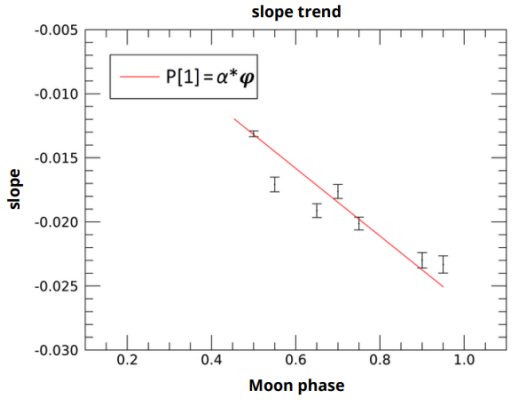
- where the slope was found to vary linearly with the Moon phase:

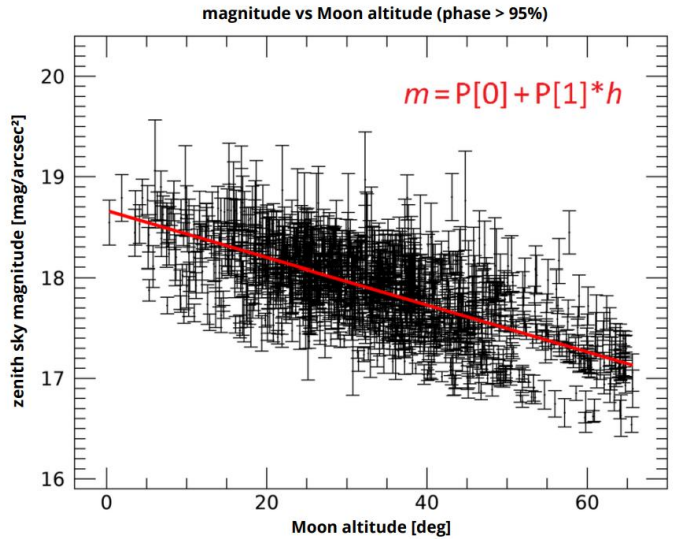
$$P_1(\phi) = a\phi \rightarrow m = P_0 + a\phi h$$

$$P_0 = 18.8\, mag \cdot as^{-2}$$

$$a = -0.026\, mag \cdot as^{-2} \cdot$$

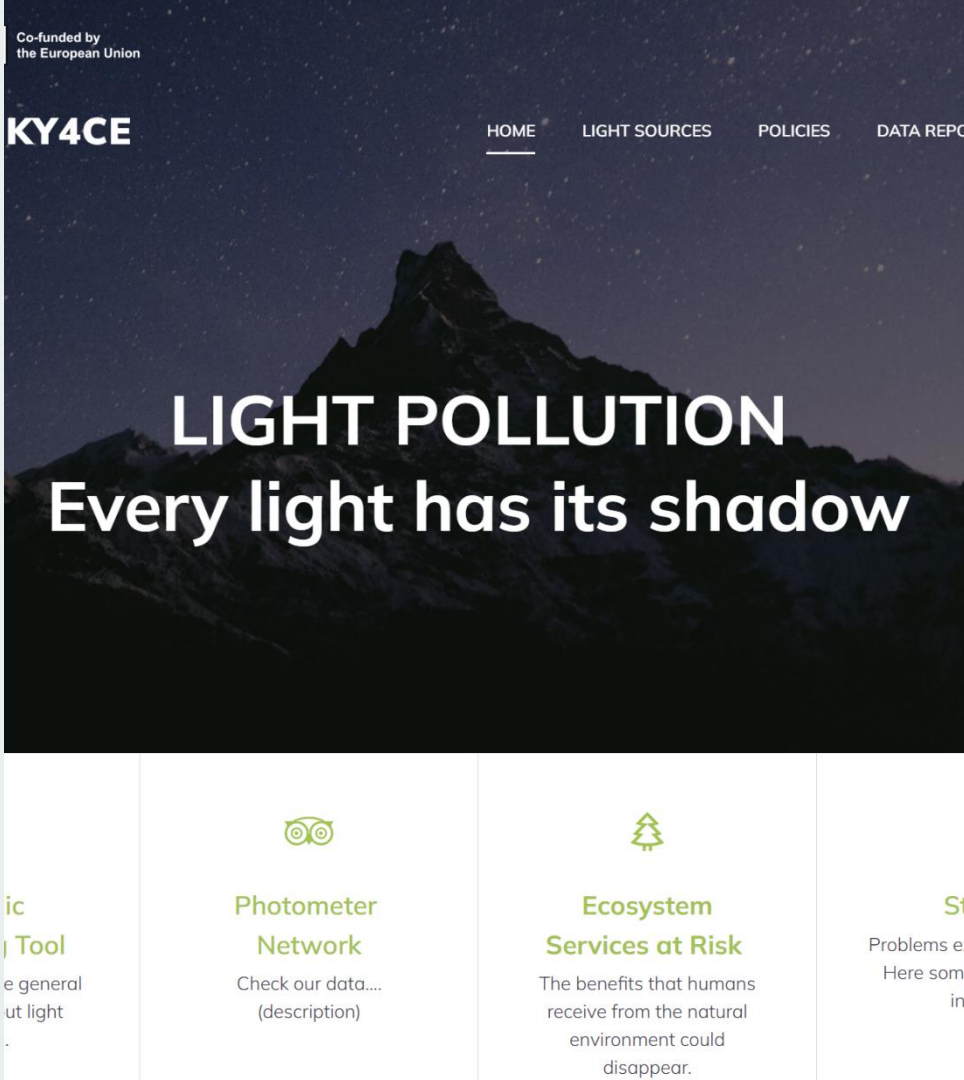
Results from **ITPI01**





Light Pollution Data Repository for CE

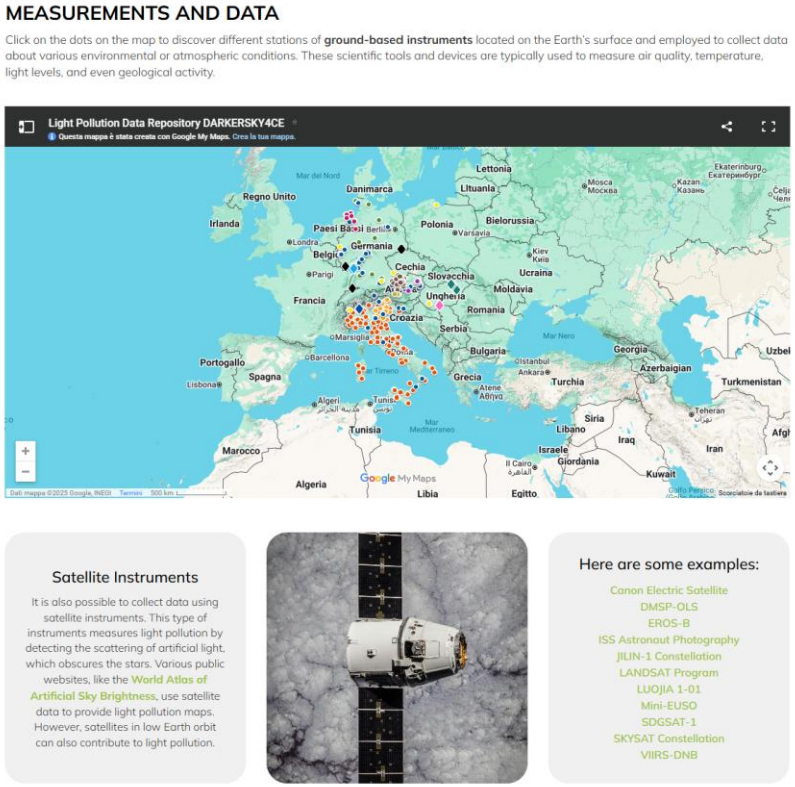
Harmonising light pollution qualitative and quantitative data for Central Europe



LIGHT POLLUTION DATA REPOSITORY

Guided Access to Light Pollution Data for Everybody

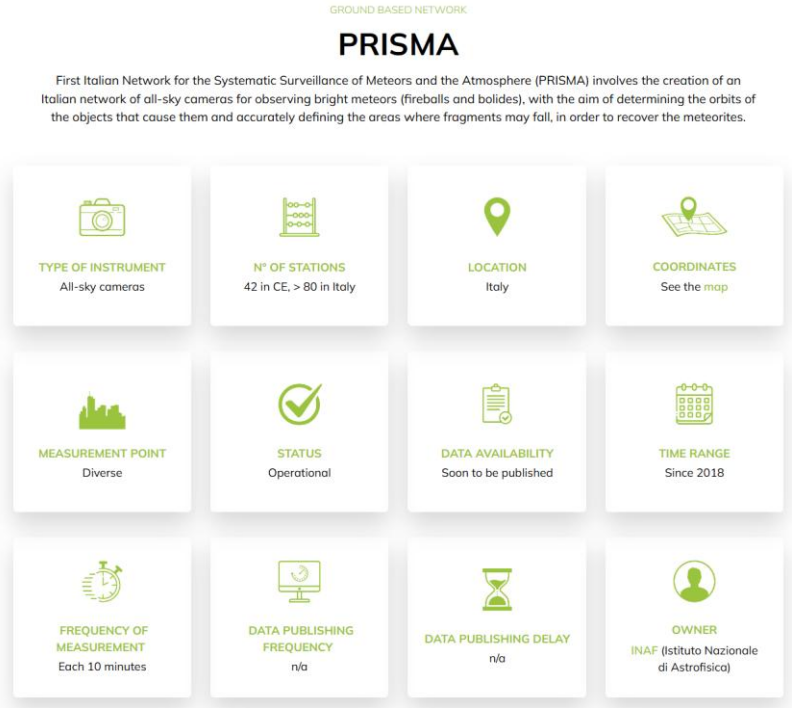
- An **open access point** to all measurements and data about Light Pollution and Dark Skies in Central Europe
- Hosted on INAF – OA Trieste infrastructure
- Accessible and useful to both **general and specific public**
- Reports **data and metadata** needed to correctly interpret the **night-sky brightness** measurements
- Points to how to get and/or request data, if they‘re calibrated or not, etc…



LIGHT POLLUTION DATA REPOSITORY

Guided Access to Light Pollution Data for Everybody

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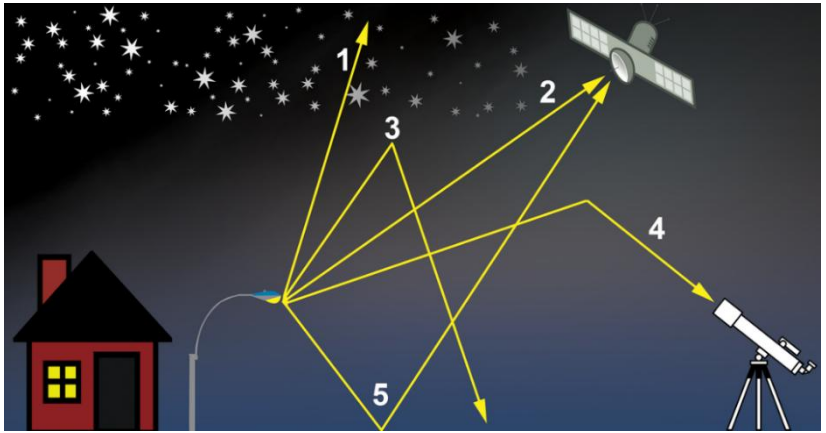


Photometre Network

Measuring the night sky brightness in Pilot Sites

PHOTOMETRE NETWORK

Why do we need a ground-based measurement network?



Satellite measurements provide a much more uniform and continuous measurements of light pollution BUT:

- Often **not calibrated**
- Often **not freely available** (or at least not completely)
- **Upward radiance** measured by space-based instruments is **not directly representative of the night-sky brightness** as perceived by the human eye or by flora and fauna (modelling is needed to interpret them)

PHOTOMETRE NETWORK

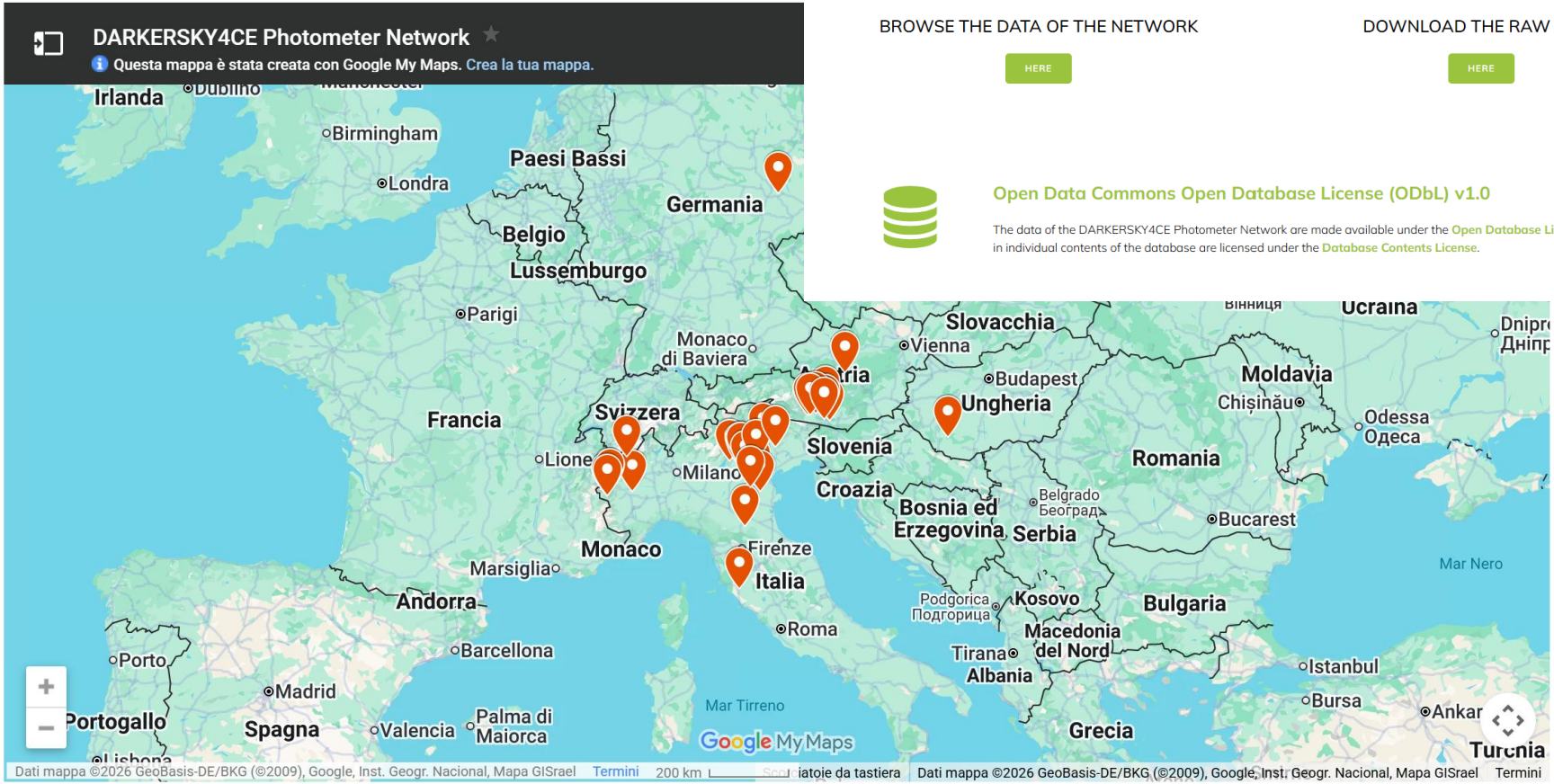
Measuring the change

- Providing **new measures of night sky brightness** where there are none, with particular focus on the areas of the Pilot Demo Sites
- **New SQMs deployed in Hungary and Germany**, with other project partner contributing with existing devices
- Data and live-time visualization **publicly available** on the LP data repository
- Focus on **measuring the change** before and after the Pilot Actions at the Demo Sites





PHOTOMETRE NETWORK



BROWSE THE DATA OF THE NETWORK

HERE

DOWNLOAD THE RAW DATA

HERE

Open Data Commons Open Database License (ODbL) v1.0

The data of the DARKERSKY4CE Photometer Network are made available under the Open Database License. Any rights in individual contents of the database are licensed under the Database Contents License.

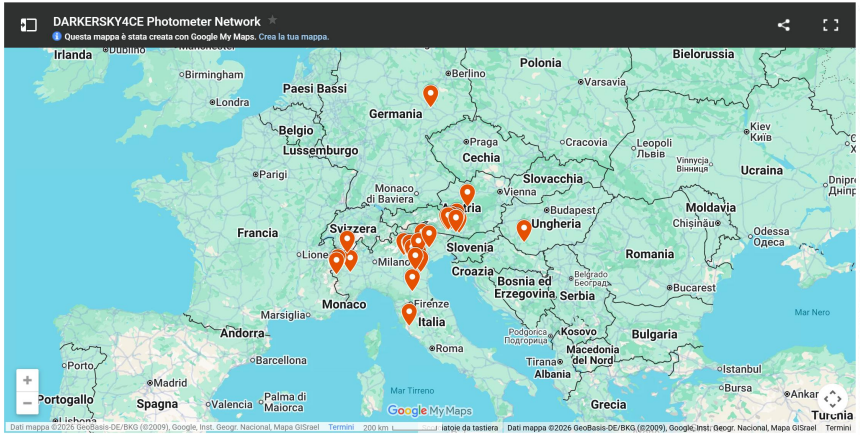
PHOTOMETRE NETWORK

BROWSE THE DATA OF THE NETWORK

HERE

DOWNLOAD THE RAW DATA

HERE



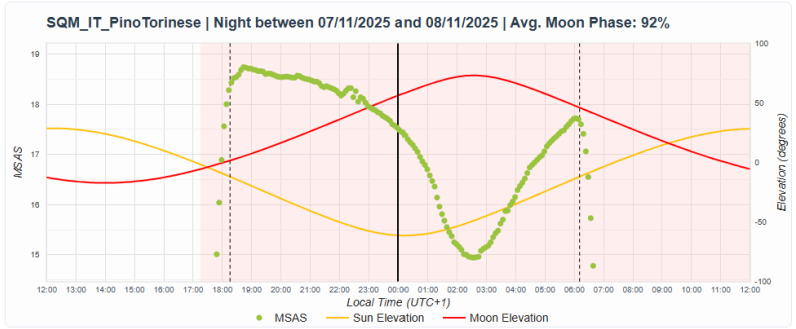
Open Data Commons Open Database License (ODbL) v1.0

The data of the DARKERSKY4CE Photometer Network are made available under the Open Database License. Any rights in individual contents of the database are licensed under the Database Contents License.

Photometer Network - Data Visualisation Tool

Device: SQM_IT_PinoTorinese | Year: 2025 | Month: 11/2025 | Day: 07/11/2025

Chart successfully plotted.

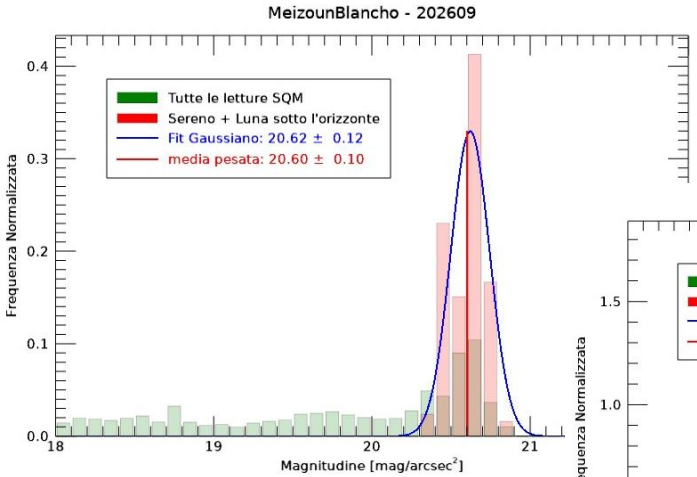


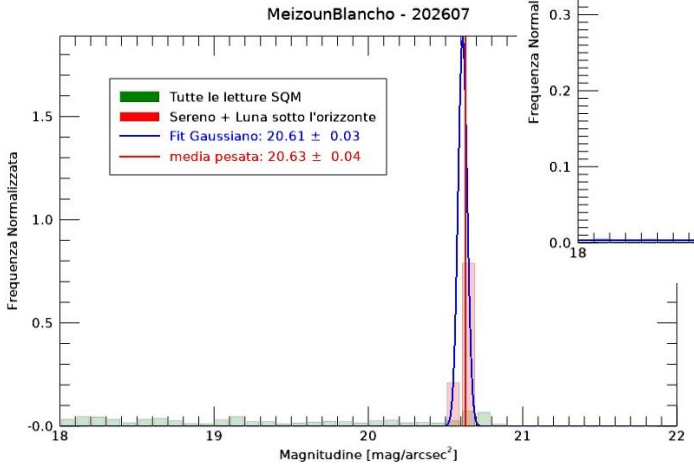
Hide MSAS | Hide Sun Elev. | Hide Moon Elev. | Hide Midnight | Hide Sunset/rise -12 | Hide Moon Above -6 | Y-Min: Auto | Y-Max: Auto | Apply Y-Axis Range | Download | Plot (PNG) | Data (TXT)

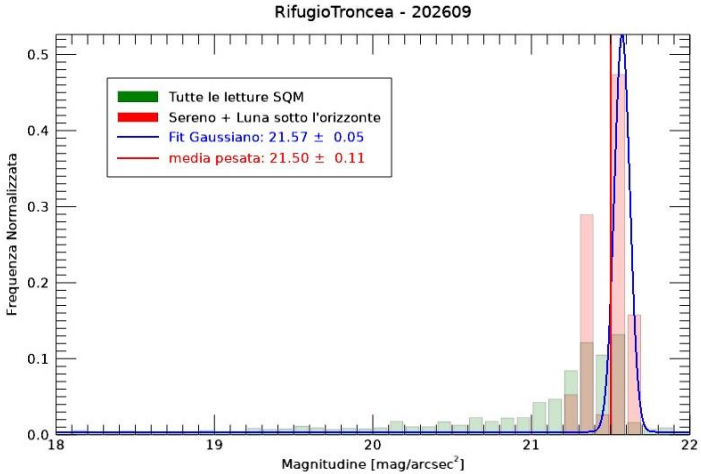
PHOTOMETRE NETWORK

Preliminary Analysis

Weather data (low, medium, high and total cloud coverage and total precipitation) downloaded daily from Copernicus through the **Open-Meteo API** service for each station





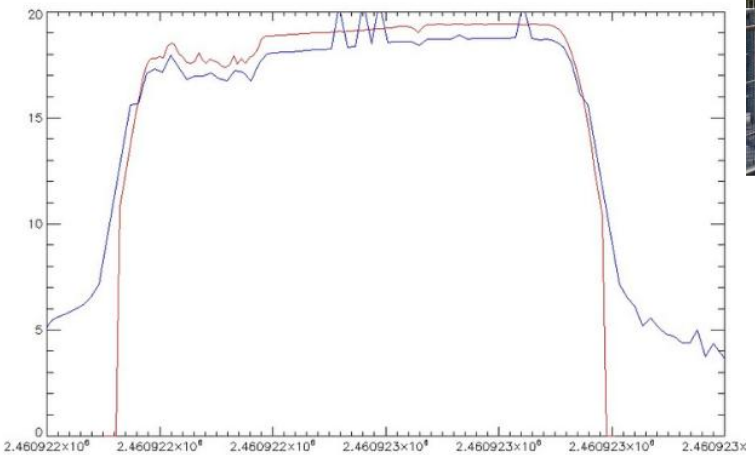


PHOTOMETRE NETWORK

First Comparison with PRISMA NSB



- In September 2025, the first Italian SQM of the DARKERSKY4CE Photometer Network was installed right next to ITPI01
- **~0.7 mag offset** between PRISMA corrected magnitude and the SQM readings on a clear night
- Plan to test the camera with **protective domes presenting different wear degrees**, in order to cross-check their impact on sky magnitude measures



Thank you for your attention!

Interreg CENTRAL EUROPE

Co-funded by the European Union

DARKERSKY4CE



Dario Barghini, Donata Bonino,
Daniele Gardiol and Chiara Lamberti
for the DARKERSKY4CE team

darkersky4ce.inaf.it

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