

Night sky protection in Czech republic

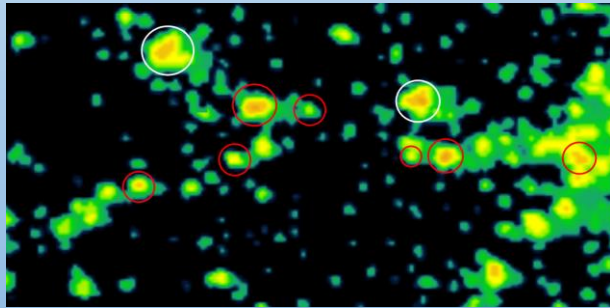
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Czech astronomical society



“Velvet revolution”

In 1989 and fall of the Iron Curtain led to rise of economic activity in mostly undeveloped and dark border regions. Elsewhere we saw accelerated suburbanization in cities, rapid growth of shopping malls and outdoor advertising, and new warehouses and industrial sites being built in the outskirts of cities and surroundings of highways. All these developments were accompanied by artificial light, and often located in places that had been previously completely dark. This era started the efforts to reduce light pollution in our country.



Light emissions of industrial and warehousing sites in western Czechia (red circles) built in the last 20 years. Towns with population ~10.000 (white circles) for comparison. Credit: Jurij Stare, lightpollutionmap.info

Raising awareness

Probably the biggest challenge of dark sky preservation efforts was complete lack of awareness among the public and decision makers alike. 20 years ago, almost no one knew what light pollution is and that artificial light brought not only benefits, but could also hurt if not used responsibly. Lighting industry pushed back stressing safety and dismissing any concerns about adverse impacts of the artificial light at night. On the other hand, this part of nature conservation was so different, that it really stood out and was quite easy to remember for everyone. Important step was declaration of the Dark sky areas, making many people realize there still were places offering what was already lost in the cities – truly dark night and starry skies. „Protecting the darkness“ was something unusual and attracted attention of mainstream media with significant impact across general population. Sustained, consistent communication through all channels is however essential. Today we use internet and social networks, provide interviews, publish printed materials, organize outreach events, lectures and presentations for schools, municipalities and various professional organizations and cooperate with network of public observatories and various NGOs.

Nowhere to escape

Czechia is relatively uniformly populated, nowhere is „far enough“ from the regional centers and thousands of villages are scattered in between. This makes light pollution omnipresent and some light domes are apparent along the horizon even at the most remote locations inside national parks.

Country's biggest astronomical observatory in Ondřejov observatory with 2m Perek telescope, operated by the Astronomical Institute of the Czech academy of sciences, is located only 30 km from Prague. When founded in 1905, proximity to the capital wasn't an issue, but since then observing conditions on the site significantly deteriorated. Nowadays, the typical zenith sky brightness is ~21.0 MSA (Bortle 5), more than twice the natural value. Darkest sites in the country (Šumava national park) can reach ~21.8 MSA (Bortle 3) on best nights, which is still ~20% above the natural sky brightness.

Dark sky places

are key element of the night environment protection efforts. There are 3 locations in Czechia that were declared „Dark sky area“, covering areas between 70 and 350 km². However, none of them has the designation of International Dark Sky Place by IDA. They were established by memorandums signed by municipalities, nature protection agencies (if applicable) and local NGOs. Participation is fully voluntary and doesn't require any legal commitments. Although responsible lighting practices were acknowledged in the founding memorandums, they cannot be enforced and serve mainly as a guide.

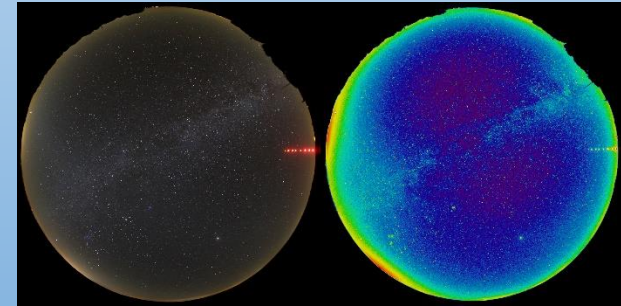
Main goals are education of the general public about light pollution, facilitating unspoiled night sky experience to urban population that lost connection with the starry skies, promote responsible lighting and highlight importance of darkness for the nature and ecosystems. Important is also promotion of these locations as unique tourist destinations.

„Jizery dark sky area“ and „Beskydy dark sky area“ are located in the protected mountainous areas on the borders with Poland and Slovakia (both are actually cross-border and truly international). „Manětín dark sky area“ is an inland rural area that doesn't enjoy any particular protection, but is surprisingly darkest (and largest) of the three.

There are various activities and public events organized thorough the year, focusing not only on astronomy and related sciences, but also on cultural heritage and ground based parts of nighttime environment (e.g. night butterflies, bats...). While these places are not perfectly dark, it is still very well possible to see phenomena like Milky way, zodiacal light and occasionally also gegenschein and airglow.

Interdisciplinary approach

For a long time, the only really concerned party were astronomers, since keeping night sky reasonably dark was essential for the research or just for the ability to admire the beauty of the universe. It inevitably caused that policymakers saw the light pollution as a marginal problem, impacting only very small group of people. This began to change when research started to indicate that exposure to artificial light at night can have adverse impacts on most living beings, including humans, disturb balance in the ecosystems, negatively impact biodiversity and can be linked to decline of population of many species. This added much needed credibility to the debate. Politicians and authorities perceive the shift and now show much more willingness to address the issue of light pollution. Interdisciplinary approach seems to be necessary in order to gain enough support for establishing any legal framework for regulation of light pollution.



Light domes above cities near Manětín dark sky area are clearly visible

Legislation in progress

Currently there is no legislation in Czechia regulating outdoor lighting. Civil code prohibits excessive obstruction by illumination, but it's difficult to prove that any obstruction is really excessive. There was an attempt to regulate light pollution in the Clean Air Act in 2002, but subsequent government decree, supposed to specify the actual limits and ban certain harmful activities, has never been adopted. Current approach assumes development of a new technical standard, specifically focused on all outdoor lighting, that is almost ready. This standard will be then referred to in the legislation, mainly in the Building Act. Key points of the standard specify requirement for zero light emissions above horizontal, maximum CCT of the light emitted (to limit short wavelength content in the light spectrum), limits on light trespass, upper limits of the illumination levels and requirement for the lighting installations to technically allow dimming during the night.

Non-legislative, but very effective tool supporting dark-sky friendly lighting proved to be financial subsidies for municipalities. This motivated suppliers to offer products not available before at competitive prices.