Report on 2006 activities of the Czech Section of the International Dark Sky Association

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1 Summary

In 2006, the Czech section of the IDA worked on research mostly, but two new educational activities, based on images of night scenes and their description emerged, with participation of dozens of authors. Of course, most outputs are available in Czech only. (Let's remember our main info in English is at `www.astro.cz/darksky`, and that the previous Section reports are within `amper.ped.muni.cz/light/ida`). As in the years before, Czech section made no financial operations, being but a collaborating group of people.

2 Research and its results

2.1 National Park at Night

Two new ski slope lighting installations within Giant Mountains (Czech: Krkonoše, German: Riesengebirge; `www.krnap.cz/en/`) National Park have been investigated. The report for the Park Administration was issued in June and is accessible in full extent within `amper.ped.muni.cz/noc/krnap/2006`.

2006 and 2005 results regarding *Skiing at night* were summarised within an article for an environmental magazine Veronica (Noční lyžování, Veronica 2006/3, p. 12-13). A non-abbreviated Czech text from May is accessible as `amper.ped.muni.cz/noc/krnap/2006/lyzovani_v.htm`.

2.2 Digital imaging photometry

The employed photometry method, further developed during 2006, has been presented (including examples esp. from the Giant Mts. Park) on the IAU congress in Prague in August, within the Commission 50 (Protection of Existing and Potential Observatory Sites) meeting: *Digital imaging photometry with common cameras – results, methods and perspectives* (`amper.ped.muni.cz/light/lectures/06IAU50t_small.pdf`, 8 MB lecture slides by J. Hollan; a 21 MB full resolution version is there too).

During autumn, the method was described in detail in Czech and presented on a workshop Non-destructive testing: RGB radiometrie digitálními fotoaparáty (RGB radiometry by digital cameras). In Workshop NDT 2006. Brno : Brno University of Technology, 2006. p. 31-37. ISBN 80-7204-487-7. See `amper.ped.muni.cz/light/luminance/czech/` (files rgb.*, or directly the pdf version).

2.3 Continuous measurement of outdoor light

A new realm has been opened by creating a system of continuous measurement of light at Brno Observatory. As a detector, a small photovoltaic panel is used. The measurement began shortly after the summer solstice 2006, so now we have more than one year of continuous data and plots. Tomáš Miléř and the Faculty of Education were the motors to make it happen. A software to plot natural light clear-sky illuminances was written with help of a priv. comm. by Paul Schlyter. See the results at `amper.ped.muni.cz/weather`.

The modern reality that clouds make the night in towns brighter instead of darker, is very apparent in our series. 2 km from the city centre, the horizontal illuminance can go up by one order of magnitude, from 0.02 lx to 0.3 lx, or even to 1 lx with snow.

I know about no other series like that. That of ours is supplemented by standard meteo data since August 2006; it illustrates nicely how the air cools down more quickly on clear nights (or clear moments at night).

2.4 Measuring luminance of small solid angles with SQM

The first cheap instrument for measuring nightime luminances has been introduced to the market in 2005 – the Sky Quality Meter. It's excellent for measuring luminance of large space angles (almost 2π, i.e. a half-space) if it is uniform – almost the case of a clear natural moonless night sky. However, in many cases this condition is not met. In January, a uses of SQM and how to re-calibrate posting described how to use it with a baffle to measure much lower solid angles, with a considerable decrease of sensitivity however. In November, I've demostrated an adaptation of the instrument, lowering the sensitivity by some 20 % only, see a glass-ball collimator for SQM (a better lens is recommended at its end). Uneven luminance within that small solid angle might then be a problem, easy to reveal by repeated measurements (rotating the SQM or changing its bearing slightly).

3 Education

My lecture on the protection of night environment was included into courses on two other universities in 2006, besides I gave two other lectures. Pavel Suchan had a seminar for teachers "Is there enough darkness for the nature?", an article in magazine EKO, a lecture, and a radio programme. LP has been included within the Astronomical Olympiad. Another authors published too.

The Czech Astronomical Society has issued a very nice small brochure on LP (2 MB).

Its West-Bohemian branch organised a photographic competition. A huge amount of contributions came, the winning ones (Czech described) see at `www.astro.zcu.cz/cs/clanky/svetlo/4/`, a broader selection `here` and all contributions `here`.

Just before the end of 2005, Jan Kondziolka started a *series based on commented images* within "Instant astronomical news". By August 2007 it had 36 issues, see `ian.cz/index_ser.php?id=6`.

For the educational portal of Masaryk Uni in Brno I wrote an article Night and Day Once and Today (Noc a den kdysi a dnes, see within `amper.ped.muni.cz/noc/a_den/`), a good candidate to be translated into English.

4 Recommendations

For my own city, I wrote an article Night environment in Brno, its Czech text see `amper.ped.muni.cz/light/texty_html/noc_prob.html`.

In autumn 2006 I was invited to collaborate (as a stakeholder) on an European study on streetlighting. It was too late to affect the study significantly. Selected letters to the study's authors are within `amper.ped.muni.cz/light/EuP/`. After taking part at the stakeholder meeting in Bruxelles on Dec 18, and identifying what needs to be done, I wrote a series of texts, the principal one being on what the Light Pollution is indeed. The first version was published before the end of the 2006, the current one is expanded, see `amper.ped.muni.cz/light/lp_what_is.pdf` or `amper.ped.muni.cz/light/lp_what_is.htm`. Even if we might think that everybody somehow knows what is LP, this is not the case. The only scientific definition has been mentioned by Pierantonio Cinzano in one of his articles, now it is contained in some laws too. I've elaborated his definition into a fully quantitative and applicable system. Lack of any such system has been the very cause, why Light Pollution was almost ignored in that study, and definitely not used as it should be, namely as the main environmental aspect of streetlighting.

The directory `amper.ped.muni.cz/light/EuP/` contains several other texts on vital aspects of streetlighting, namely on relevant luminaire parameters, on technologies to achieve full shielding, on antireflection coatings (with cost below 10 euro per square metre). But these were written in 2007 only... Similarly, the needed development of ies2tab programme took place in early 2007 (`amper.ped.muni.cz/light/ies2`).