

IAU Resolution 2009 B5 - Commission 50 Draft Action Plan - Presentation and Discussion

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Abstract. IAU Resolution 2009 B5 calls on IAU members to protect the public's right to an unpolluted night sky as well as the astronomical quality of the sky around major research observatories. The multi-pronged approach of Commission 50 includes working with the lighting industry for appropriate products from the solid state revolution, arming astronomers with training and materials for presentation, selective endorsement of key protection issues, cooperation with several other IAU commissions for education and outreach, and provision of clear quantitative priorities for outdoor lighting standards.

Keywords. Site protection, Light pollution, Outdoor lighting

1. Key Excerpts from the Resolution

An unpolluted night sky that allows the enjoyment and contemplation of the firmament should be considered a fundamental socio-cultural and environmental right, and that the progressive degradation of the night sky should be regarded as a fundamental loss; IAU members [should] be encouraged to take all necessary measures to involve the parties related to skyscape protection in raising public awareness of the educational, scientific, cultural, health and recreational importance of preserving access to an unpolluted night sky for all humankind. Protection of the astronomical quality of areas suitable for scientific observation of the Universe should be taken into account when developing and evaluating national and international scientific and environmental policies, with due regard to local cultural and natural values.

2. General Means to Accomplish the Objectives and Practical Implementation

The Commission can promote engagement of more of the astronomy community to include the message in their public outreach activities. There is still momentum from the IYA. Providing one or two effective slides in every public talk could be very powerful. At more depth, a package could include vision and background statements with supporting material to those astronomers who are prepared to be more engaged in educating the public. This is where the International Dark-Sky Association can be a prime source, because of their strong approach to implementing sky protection goals. During discussion, the IDA executive officer proposed receiving direct support to develop the information to comprise an IAU dark skies standard outreach package available to astronomers. It would cover areas of value of night sky protection, outdoor lighting design issues, and model ordinance, among others. Promotion of availability would be through the IAU Newsletter and through direct contact with national astronomical societies.

As a key technical activity of Commission 50, it should support continuing work with the lighting industry, so that there are products available to support astronomer goals of full cut-off and limited spectral pollution. This area is where Commission 50s highly beneficial and productive engagement with the International Commission on Illumination, CIE (<http://cie.co.at/>), is worth amplifying to keep the positive interaction at a high level. Identify and prioritize the key upcoming meeting opportunities with the lighting industry, recruit participants, and work with their institutional leaders to generate support for their participation. We also note the CIE is influential, particularly in Europe, with their published outdoor lighting standards. They are not yet fully consistent with the goals of the resolution, but the CIE has encouraged astronomer participation in their Working Groups with studies that impact revisions.

Protection of astronomical sites is often a lonely battle in an isolated area. Commission 50 can help those astronomers who are engaged with local, national, and international authorities to protect astronomical sites. It is widely noted that past presidents of Commission 50 have been doing yeoman's service in their work to get sites into the World Heritage category for protection. The broader themes of the Resolution include supporting astronomers who are engaging local and national authorities for lighting regulation to protect natural, historic, and ordinary local areas from light pollution encroachment. Commission 50 can provide a forum for information exchange among those working on dark sky protection. Production of IAU letters of endorsement to relevant entities attesting to the astronomical value of a site can have real value in such activities. A stronger result could be multi-agency (or IAU) funding requests for support of specific protection measures.

It is clear that education and outreach are key to making progress on the objectives of the Resolution, both to astronomers and by astronomers to the general public. Close collaboration with Commission 46 (co-sponsor of this Special Session) is obviously critical, as well as with Commission 41 on communicating astronomy with the public. Engaging with Commission 55 and their working group on Astronomy and World Heritage will be vital for protection of natural and historic areas.

3. Commission 50 priorities for outdoor lighting

1. Full cut-off shielding. Light emitted just above the horizontal has the most deleterious impact. As a rule without exception, this full shielding approach is not yet accepted in CIE standards, particularly for roadway lighting.

2. Spectral management to minimize blue-light threat. Preservation of spectral access to the night sky in the near zones around research observatories is best achieved with narrow-band amber LEDs, the next generation replacement for low-pressure sodium. The near-term issue is that they do not produce the same level of energy savings as broader-band sources. Urban lighting requirements are different for distant observatories and for the general public in the context of the Resolution. As shown in these proceedings by Luginbuhl, blue light from urban centers has largely been scattered away before reaching distant research facilities; however, the public's right to a dark night sky requires minimal blue light for outdoor lighting. A conservative figure is limiting the output of a luminaire to no more than 15% of its radiated energy at wavelengths shorter than 500 nm.

3. Zone-appropriate lighting levels, including curfews. These principles are in place in both CIE and International Energy Conservation Code guidelines. Astronomers will need to exert downward pressure on the absolute lighting levels prescribed based on zone descriptions.