



VORTRAG

Understanding Light Pollution and Urban Emission Functions
Wednesday April 19, 10:15 / GAFO 03/252

Prof. Brian Espey, School of Physics, Trinity College Dublin, Ireland

Abstract: Astronomers first recognised the deleterious effect of light pollution on the night sky and its impact on their observations and moved observatories to more distant sites. Currently sky brightness is estimated to be increasing at approximately 6.5% per year in Europe, and nearly 10% globally. Some observatory locations are being increasingly impacted by this growth and many of today's children will never see the Milky Way in a pristine night sky. While the advent of LED technology should have heralded an improvement in night sky conditions, there are additional problems with cheap blue-rich lighting technology which, from an astronomer's perspective, can lead to worsening sky conditions.

Closer to our urban areas it is increasingly recognised that the bright night-time environment is having important ecological and health consequences, as well as an energy and carbon cost. For all these reasons we need to better understand light pollution, its main sources, and how it can be mitigated. While a range of empirical and analytic models have been developed to understand how light leaves the urban environment, some involving the application of radiative transfer codes, the assumptions and modelling can be either too simplistic or overly computationally intensive to be applied to realistic urban environments.

In my talk I shall give an overview of light pollution and describe a computationally efficient geographical information system (GIS) based approach to the estimation of urban light pollution. I shall illustrate the approach with an application to the question of how foliage affects light levels and also quantitatively compare predictions with calibrated International Space Station imagery.