## What do we learn from surveys (GAIA, Pan-STARRS, VISTA, etc) concerning the structure and phases of the ISM (3D ISM, extinction curve and diffuse bands studies)

Laurent Cambrésy<sup>1</sup>

<sup>1</sup> Observatoire Astronomique de Strasbourg, UMR 7550, Université de Strasbourg, 11 rue de l'Université 67000 Strasbourg – France

The solution for the dark night sky paradox suggested by Olbers (1823) is actually the first mention of a non-transparent Interstellar Medium (ISM). The paradox is solved by extinction (which we know now is wrong!). Extinction is a fundamental property of the ISM which is basically observed from short wavelengths to the mid-infrared. In my talk I discuss the impact of the large surveys that produce star catalogues with accurate photometry on the ISM studies. They allow the mapping of the extinction independently of the dust grain temperature fluctuations, which contaminate the column density maps derived from dust thermal emission; these star catalogues also make it possible to constrain the extinction law. When the distances of the stars are known, the third dimension of the ISM structure can be investigated. Hipparcos, in the early 90's, was not accurate enough for such analysis but a wealth of new data is arriving with surveys such as Pan-STARRS and Gaia. The 3D extinction measurement from these surveys, combined with the submm/mm emission will obviously help us to understand the ISM better.