



A new light scattering laboratory at the Instituto de Astrofísica de Andalucía in Granada, Spain

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The study of light scattering give us valuable information about the physical properties of the scattering particles. In light scattering studies is essential to obtain the scattering matrix, which is a 4x4 matrix that relates the Stokes vector of the incident light with that one of the scattered light at each scattering angle. For a given size distribution of particles, the scattering matrix can be determined by numerical methods (with limitations on both, sizes and refractive indices) or by experimental measurements with a light scattering setup. Both methods are complementary.

We are building, at the Instituto de Astrofísica de Andalucía in Granada, (Spain), a new laboratory to study the light scattered by mineral particles. Although this facility can be employed in several branches of the light scattering science, our main purpose is to obtain scattering matrices of both analogues of cometary particles and atmospheric aerosols. Our purpose is to get all the elements of the scattering matrix as a function of the scattering angle in the visible part of the spectrum. This set-up is a modern version of that located at the Astronomical Institute Anton Pannekoek, University of Amsterdam. The laser of the device can works at five wavelengths (all in the visible range): 438, 488, 514, 568 and 647 nm. The instrument is designed to obtain measurements at scattering angles from 3 to 177 degrees. A device, which produces a laminar flow, will keep clean the experimental area with a class 100 clean room conditions. The optical alignment is done automatically, and the control is made by means of a personal computer placed at a neighbouring room. We describe here all the different parts of this scattering laboratory as well its more relevant characteristics.