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## Spectroscopic and ellipsometric approach to polymer and hybrid thin films

Thin films of polymers and their hybrid compounds are advancing rapidly due to their technological applications in electronics, photonics, and multidisciplinary nanotechnology. Characterization methods must be refined appropriately to obtain information and data useful in the design and analysis of devices. With this aim, the material-science approach has improved; therein, optical spectroscopies are the method of choice for determining the dielectric response in the UV-vis-IR spectral range.

In isotropic 1D structures, polarized amplitudes and phases at variable angles of incidence allow for solving the correlation issue between optical functions and film thickness. We studied 1D Bragg Reflector structures and engineered photonic microcavities, creating a favourable compromise between growth processing, structure stability, and large refractive index contrast. Moreover, molecular interactions, conformational changes, and growth procedures create anisotropy in the dielectric response and semiconductor conductivity; we then extended our investigation to a full set of anisotropic optical functions, revealing polarization-controlled photonic effects.

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