1047-42-180   **Marlos A.G. Viana*** (`viana@uic.edu`), 1855 W. Taylor St., Chicago, IL 60612, and **Vasudevan Lakshminarayanan**. *Dihedral Fourier Analysis in Statistical Optics.*

In this talk we will derive the basic spectral analysis for bivariate dihedral Fourier analysis in the context of phase-space optics applications. The data-analytical aspects of those applications will follow from the connection between the Fourier-inverse formula and the canonical decomposition theorem for the regular representation of finite groups and its role in the standard principles of statistical inference. The notion of data indexed by planar dihedral orbits will be introduced with the purpose of demonstrating its efficiency in the characterization of certain elementary optical features, such as those present in refractive profiles. (Received January 30, 2009)