The Kansas State Interpretation of Light Scattering

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**ABSTRACT:** In this talk I will discuss a perspective of light scattering by particles that starts at the wave diffraction limit and then adds the electromagnetic nature of light. The wave diffraction limit leads to the use of the scattering wave vector $q$ as the angular variable in an analysis method that we call the “Q-space analysis”. This method involves plotting the scattered intensity versus the scattering wave vector on a double log plot. The analysis uncovers power law descriptions of the scattering with quantifiable exponents and length scale dependent crossovers between the power laws for a wide variety of particles including Mie scattering by spheres, fractal aggregates, irregularly shaped particles such as dusts and perturbed spheres. A clear benefit of Q-space analysis is that it provides a simple and quantifiable description of light scattering that can be used to differentiate scattering by particles of different shapes. An unfolding benefit is that it leads to a new interpretation of what happens when light scatters from any object in terms of the convolution of diffraction and electromagnetism.

**BIO:** Christopher M. Sorensen is the Cortelyou-Rust University Distinguished Professor and a University Distinguished Teaching Scholar in the Departments of Physics and Chemistry (adjunct). He has won numerous teaching awards. In 2007 he was named the CASE/Carnegie Foundation United States Professor of the year for doctoral universities. He is also an active scientist with over 280 publications, six patents and three pending. In 2003 he won the Sinclair Award of the American Association for Aerosol Research, and he is a past president of that organization. He is a Fellow of the AAAR, the APS and the AAAS. Chris graduated from the University of Nebraska in 1969 where he was Phi Beta Kappa and a Woodrow Wilson Fellow. He was drafted and served in Vietnam. He earned his PhD in physics from the University of Colorado in 1977. In 2008 he was named a Norlin Distinguished Graduate of that university."