

# This Week in Physics

SYRACUSE UNIVERSITY  
College of Arts & Sciences

Week of

January 26, 2009

[http://www.phy.syr.edu/  
SeminarsEvents.htm](http://www.phy.syr.edu/SeminarsEvents.htm)

DEPARTMENT OF PHYSICS

201 Physics Building  
Syracuse NY 13244-1130

Phone: 315-443-3901  
Fax: 315-443-9103  
Email: [davis@phy.syr.edu](mailto:davis@phy.syr.edu)

## MONDAY, JANUARY 26

Joint Relativity/Cosmology/High Energy Physics Seminar  
3:00 PM, Rm 202

Prof. Al Shapere (University of Kentucky)  
*4D conformal field theories from  $a$  to  $c$*

## THURSDAY, JANUARY 29

Colloquium

4:00 PM, Rm 202 (refreshments 3:30 PM, Rm 204)

Dr. Cosmas Zachos (Argonne National Laboratory)  
*DEFORMATION QUANTIZATION: Quantum Mechanics Lives & Works in Phase-Space 9*

Wigner's 1932 quasi-probability Distribution Function in phase-space is a special (Weyl) representation of the density matrix. It has been useful in describing quantum flows in: semiclassical limits; quantum optics; nuclear physics; decoherence (eg, quantum computing); quantum chaos. It is also of importance in signal processing (time-frequency analysis). Nevertheless, a remarkable aspect of its internal logic, pioneered by J Moyal, has only emerged in the last quarter-century: It furnishes a third, alternate, formulation of Quantum Mechanics, independent of the conventional Hilbert-space, or path-integral formulations, and perhaps more intuitive---since it shares language with classical mechanics. It is logically complete and self-standing, and accommodates the uncertainty principle in an unexpected manner. Simple illustrations of this fact will be detailed.

