Department of Physics and Physical Oceanography

"Decoding Secrets of Perturbation Theory and Path Integrals"

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Abstract: Quantum mechanics and quantum field theory is at the root of our understanding of many natural phenomena, and can both be formulated in terms of Feynman's path integral. A standard way to study either is to use perturbation theory. In general cases, the perturbative expansion has an interesting structure, it approaches to the correct result up to a certain order, but almost never reaches it, and after that it almost always diverges asymptotically. Physicist often drop the part that diverges and accept the fact that perturbation theory has an inherent vagueness, and cannot produce the exact result. This inherent vagueness is called "non-perturbative". It turns out that the divergent part that is dropped is actually a "code" waiting to be decoded. The story I will tell you is how to extract physics from this mathematical code.

Friday September 15, 2017
2:00 PM
DeLoach Hall, Room 212

Refreshments will be served at 1:50 PM