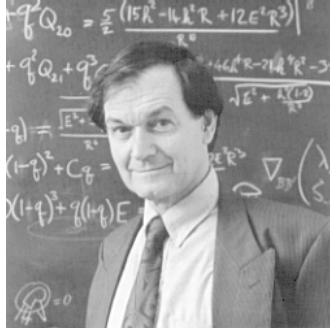


# Special Physics Colloquium

## Is Quantum State Reduction an Objective Gravitational Effect? Some New Theory and Experiment



Lecture presented by Prof. Sir Roger Penrose

### Abstract:

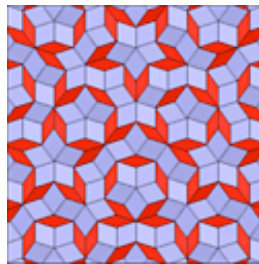
Quantum theory is one of the supreme achievements of the 20<sup>th</sup> century. Yet its measurement problem points to a deep paradox. I propose that its resolution demands a change to the theory, the nature of which depends upon the principles of that other great achievement of the 20<sup>th</sup> century physics: Einstein's general theory of relativity. I shall describe an actual physical experiment presently under active investigation in Oxford and Santa Barbara, which is aimed at eventually testing this proposal.

**Monday September 8<sup>th</sup> at 3:00PM in Rm201 Natural Sciences Building**

Sponsored by The Society of Physics Students and the UAF Physics Department with support from the UAF Provost's Office, the Office of Vice Provost for Research, the Geophysical Institute and the College of Science, Engineering and Mathematics

Sir Roger Penrose, the Emeritus Rouse Ball Professor of Mathematics at the University of Oxford, was knighted in 1994 for his outstanding contributions to science and mathematics. He has also received a number of prizes and awards including: The 1988 Wolf Prize which he shared with Stephen Hawking for their understanding of the universe, The Royal Society Royal Medal, The Albert Einstein prize, and The Dirac Medal, among others.

His 1989 book *The Emperor's New Mind* became a best-seller and won the 1990 (Rhone-Poulenc) Science Book Prize. He has written 3 books since then including the (1994) book *Shadows of the Mind*, *The Nature of Space and Time* (1996) with Stephen Hawking, and *The Large, the Small and the Human Mind* (1997). His research interests vary from geometry, having made contributions to the theory of non-periodic tilings, to relativity theory and the foundation of quantum theory. He has also made remarkable contributions to the science of consciousness. His main research area has been the development of the theory of twistors, which he originated over 30 years ago as an attempt to unite Einstein's general theory of relativity with quantum mechanics. While most of his work pertains to relativity theory and quantum physics, he has also been fascinated with a field of geometry known as tessellation, the covering of a surface with tiles of prescribed shapes. Some of these non-periodic tiles have been commercialized as "Penrose tiles" and have actually been used in buildings. Sir Roger currently resides in Oxford with his wife and son.



An example of a Penrose tiling

For more information contact 474-7339 or 474-7858