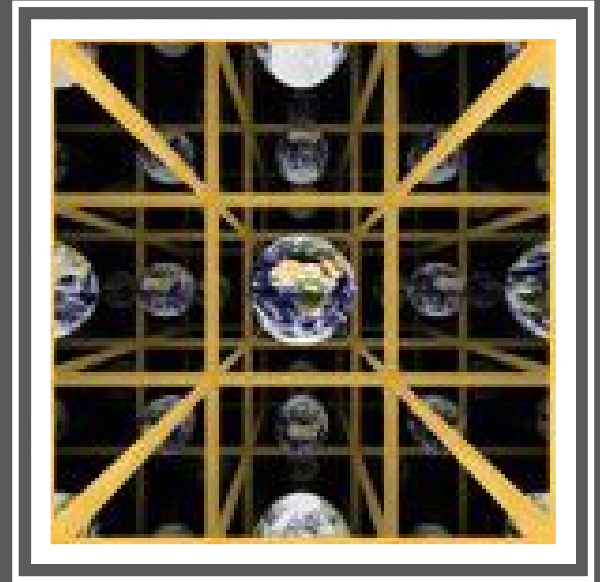# KIEVAL LECTURE SERIES TALKS

FEATURING

JEFF WEEKS

FROM CANTON, NEW YORK

VISUALIZING FOUR DIMENSIONS
Thursday, May 22, 11 am, Taylor Hall, rm 20
An introductory lesson on visualizing 4-dimensional space, with physical and philosophical applications as time permits.

THE SHAPE OF SPACE
Thursday, May 22, 7 pm, SC, rm 118
When we look out on a clear night, the universe seems infinite. Yet this infinity might be an illusion. During the first half of the presentation, computer games will introduce the concept of a "multiconnected universe". Interactive 3D graphics will then take the viewer on a tour of several possible shapes for space. Finally, we'll see how recent satellite data provide tantalizing clues to the true shape of our universe. The only prerequisites for this talk are curiosity and imagination. For middle school and high school students, people interested in astronomy, and all members of the SOU community.

WHERE DO SPHERICAL SPACES COME FROM?
Friday, May 23, 11 am, Taylor, rm 20
Astronomical observations tentatively hint at a spherical universe. Interactive 3D graphics will give participants an intuitive understanding of the various possible spherical spaces ("spherical 3-manifolds"). In particular, we'll see visually how they all arise from the finite symmetry groups of an ordinary sphere (a "2-sphere").

CURVED SPACE WORKSHOP
Friday, May 23, 3 pm, Britt Ballroom
How can one visualize curved space? Students will first construct physical models introducing the concept of a curved surface. Interactive 3D graphics will then extend the concept to curved 3-dimensional space. Finally we'll see how measurements of the cosmic microwave background radiation are now placing limits on the curvature of the universe. For math and science students. Prior attendance at the Thursday evening presentation, while encouraged, is not required.

Jeff Weeks is a freelance mathematician living in Canton, NY. He holds an A.B. from Dartmouth College and a Ph.D. from Princeton University, both in mathematics. A former MacArthur Fellow (1999-2004) and current National Science Foundation award recipient (2005-2008), Jeff splits his time between research and education. His present research centers on a collaboration with cosmologists to test the shape of the universe using satellite data. His educational activities have lead to a multimedia unit for middle schools on geometry and space. The unit uses classroom activities, computer games, and video to let students explore universes that are finite but have no boundaries. Jeff is the author of the book The Shape of Space (Marcel Dekker, 1985; second edition 2002), the unit Exploring the Shape of Space (Key Curriculum Press, 2001), and numerous research and expository articles.

SOUTHERN OREGON UNIVERSITY