# Institute for Materials Science

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## IMS Distinguished Lecture Series

**Douglas J. Scalapino**
**Research Professor of Physics**
**University of California, Santa Barbara**

# Pairing in the bilayer Hubbard model: A connection between the cuprates and the Fe-based superconductors

**Thursday, June 9, 2016**
**2:45pm**
**MSL Auditorium (TA-03 - Bldg 1698 - Room A103)**

**Abstract:** The question of the origin of the microscopic mechanism or mechanisms that give rise to pairing in the cuprate and Fe-based superconductors remains an unsettled issue. Is the mechanism similar for these two classes of materials and if so, what does it involve? One answer to this has been that spin-fluctuation mediated pairing is the common thread which is responsible for superconductivity in these materials. Clearly this is an issue that will be settled experimentally. However support for this idea can be found in the behavior of the bilayer Hubbard model which is the subject of this talk. The bilayer Hubbard model illustrates how d-wave ( cuprates) , s+- wave ( Fe-pnictides) and the apparent s-wave pairing observed in K_xFeSe can arise from spin-fluctuations in the same model as the band-structure is changed.

**Bio:** Douglas Scalapino graduated from Yale in 1955 and received his PhD in physics from Stanford in 1961. He did post doctoral work with J.R. Schrieffer and joined the University of Pennsylvania Physics faculty in 1964. In 1968 he moved to UCSB where he is presently a Research Professor of Physics. In 1978 he and his colleagues J. Hartle, R. Sawyer and R. Sugar founded the NSF Institute for Theoretical Physics. He has work on strongly correlated electron systems focusing on their magnetic and superconducting properties. He is a member of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences and has been awarded the Julius Lilienfeld, John Bardeen and Eugene Feeberg Prizes.

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***Hosted by Alexander Balatsky * Director of the Institute for Materials Science***

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