

## **The solar dynamo: timescales and modulational processes**

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In this talk I shall review the physical processes that lead to the generation and modulation of the solar activity cycle. I shall describe the various scenarios for generation of the magnetic field and discuss the strengths and weaknesses for these scenarios. I shall argue that the most likely origin for the modulation of the solar cycle is the nonlinear interaction of the magnetic field with the differential rotation and present models that lead not only to the formation of Grand Minima, but also to the flipping of the polarity of the solar field that may have important consequences for models of solar variability.