# Solar Evolution & Extrema

A project under the auspices of SCOSTEP's VarSITI program, Variability of the Sun and Its Terrestrial Impact


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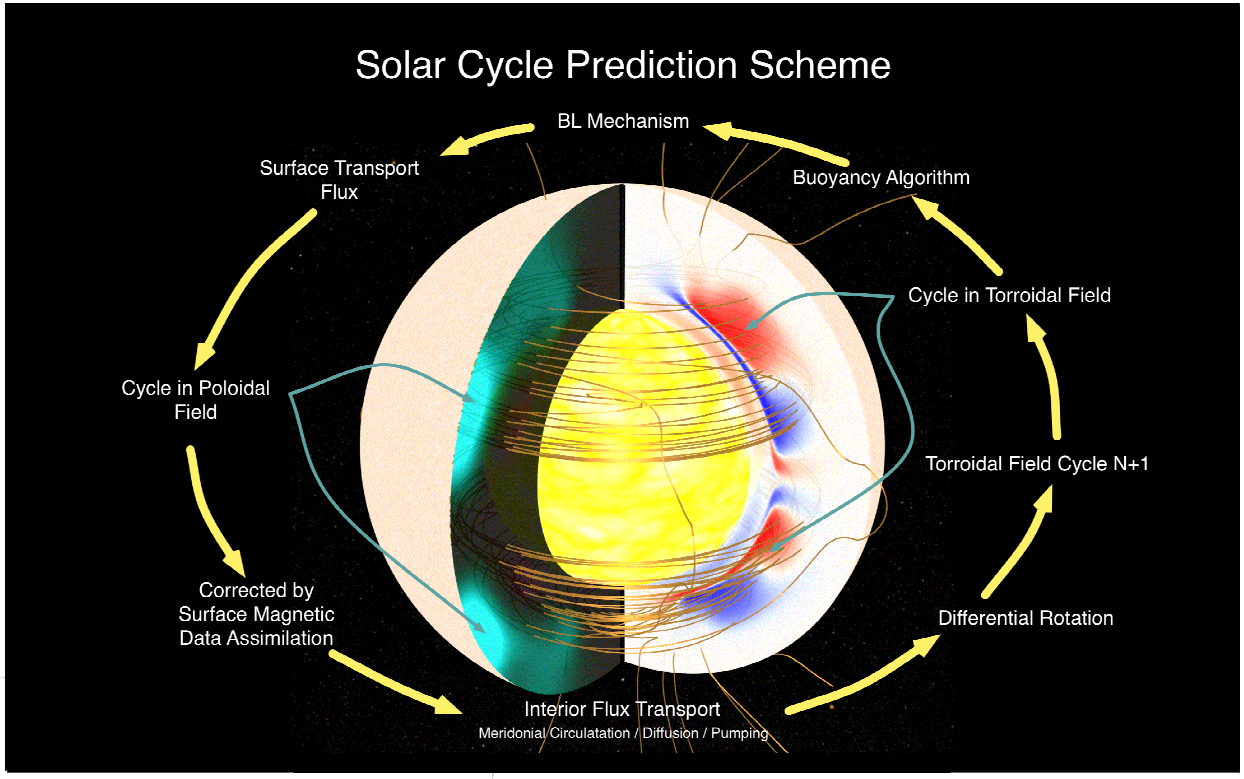


Are we at the verge of a new grand minimum ?

SCOSTEP
Scientific Committee on Solar-Terrestrial Physics

## Science Questions:

1) Are we at the verge of a new grand minimum? If not, what is the expectation for cycle 25?
2) Does our current best understanding of the evolution of solar irradiance and mass loss resolve the "Faint Young Sun" problem? What are the alternative solutions?
3) For the next few decades, what can we expect in terms of extreme flares and storms, and also absence of activity? Another Carrington event? What is the largest solar eruption/flare possible? What is the expectation for periods with absence of activity?

## Goals & Objectives:

1) Reproduce magnetic activity as observed in the Sunspot record, including grand minima and extended minima in dynamo simulations,
2) Amalgamate the best current models and observations for solar spectral and wind output over the Earth's history,
3) Determine the size and expected frequency of extreme solar events; flares and CME's.

## Anticipated Outcomes:

1) Dynamo Models for the near future, including a prediction for cycle 25, or for an upcoming grand minimum,
2) A timeline of solar activity -- spectral radiation, wind, CME's - from the Earth's formation up to the present,
3) A frequency distribution and near term likelihood prediction of