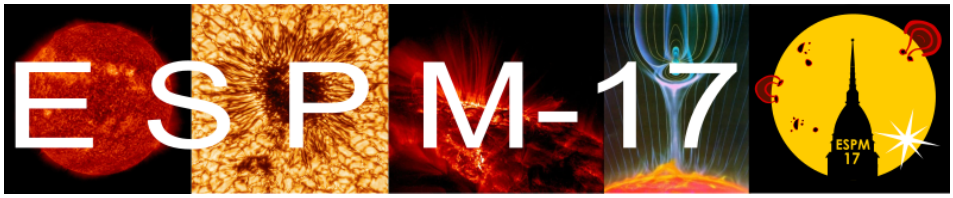


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# Dynamo of the solar interior: Powering the decadal cycle and Its comparison to stellar magnetic cycles

*Monday 9 September 2024 09:10 (25 minutes)*

The solar magnetism is generated and sustained through an internal dynamo. This process is driven by the combined action of two main mechanisms: turbulent convective motions and large-scale differential rotation (DR). The subsequent magnetic-field build-up can lead to intense surface eruptive events, but also sustain longer-term magnetic cyclic variabilities, such as the Sun's 11-year cycle. How is this magnetic activity powered? Evidence of magnetic cycles has also been reported on other solar-type stars, ranging from a few years to a few tens of years. How are these cycles controlled, and what can we learn from them?

In this talk, I will provide an overview of our current understanding of the dynamo operating within the solar convective envelope. I will especially focus on an extensive numerical study of the dynamo origins in solar-type stars, based on a series of 15 3D-MHD simulations, and illustrate what we can learn from this stellar context. In particular, this survey allows to propose a possible explanation for why the Sun possesses a long decadal cycle and to assess the power needed to maintain such magnetic activity. Finally, I will discuss how these models can be compared to current observations and further refined to improve our understanding of the solar dynamo.

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