

# Models of stellar magnetism

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In this talk, we will review some aspects of the stellar magnetism and in particular what numerical simulations tell us about the physical processes underlying the observations. In cool Sun-like stars, a convective dynamo is thought to be responsible for the presence and evolution of magnetic fields. One important aspect of stellar dynamos is the possible presence of magnetic cycles, whose characteristics depend on the stellar parameters. Another question is how magnetic flux is transported from the interior to the surface to produce starspots and whether those spots play a role in the dynamo process. In hotter and more massive stars, the manifestations of a magnetic field are drastically different. Only 5 to 10% of those stars seem to exhibit a strong dipolar magnetic field while most of the other stars are thought to possess a weak complex field. The reason for the existence of this magnetic dichotomy could be linked to the development of magnetic instabilities. Finally, magnetic fields are also thought to play a key role in the angular momentum transport in more evolved red giant stars. We will show in this talk that numerical simulations may help us tackle several of the above key questions about stellar magnetism.