The stellar complement: what we cannot readily learn from the Sun alone about its activity.

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The combination of solar and stellar observations stimulates advances in our understanding of the magnetic activity of the Sun as it combines detailed empirical knowledge of a single star with access to a wide range of stellar parameters such as internal structure, age, rotation, and even tidal forcing in close binaries. The study of the solar-stellar connection has taught us, among others, how dynamos depend on stellar parameters, under which conditions stellar activity saturates, how prevalent activity cycles are, and how non-radiative energy is distributed over atmospheric domains with widely different physical properties. This knowledge is now being complemented by the growing evidence for self-similarity in evolving magnetic geometry and for scale-free frequency distributions in, e.g., spectra of emerging solar bipolar regions, sunspots, and in flare energies for both Sun and stars. What can we conclude from the solar-stellar studies, for example, about variability of the cycling solar activity or about the largest possible active regions and their flares and coronal mass ejections?