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## **Galactic magnetic field**

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Our understanding of the Galactic magnetic field (GMF) has improved considerably in recent years, although it remains far from adequate. The Jansson-Farrar (2012) (JF12) GMF model is the most realistic and comprehensive model available, having been constrained by fitting all-sky Faraday Rotation Measures of extragalactic sources simultaneously with WMAP polarized (Q,U) and total synchrotron emission maps a total of more than 10,000 datapoints, each with measured astrophysical variance. In addition to disk and toroidal halo components, a coherent poloidal field can be shown to be necessary. Moreover a striated random component is needed in addition to a fully random component, in both disk and halo. The out-of-plane (poloidal) field provides a heretofore-overlooked escape route for CRs by anisotropic diffusion along its field lines, drastically modifying CR transport.

This talk will report recent developments: i) key features of the global structure of the coherent field and how robust they are, ii) magnification of sources and deflection of UHECRs in the GMF, for rigidities ( $E/eZ$ ) above 2 EV, iii) anisotropy constraints on the Galactic-extragalactic CR transition for transient source models, and iv) transport of CRs from a source at the Galactic center.