

Observing Interstellar and Intergalactic Magnetic Fields

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A variety of approaches are used to investigate interstellar and intergalactic magnetic fields these fields. Observational results of these magnetic fields are reviewed: The large-scale magnetic fields in the Milky Way have been best probed by Faraday rotation measures of a large number of pulsars and extragalactic radio sources. The coherent Galactic magnetic fields are found to follow the spiral arms and have their direction reversals in arms and interarm regions in the disk. The azimuthal fields in the halo reverse their directions below and above the Galactic plane; The orientations of organized magnetic fields in nearby galaxies have been observed through polarized synchrotron emission. Magnetic fields in the intracluster medium have been indicated by diffuse radio halos, polarized radio relics, and Faraday rotations of embedded radio galaxies and background sources. Future observational perspectives are given to reveal the 3D tomography of the large-scale coherent magnetic fields in our Galaxy and nearby galaxies, a better description of intracluster field properties, and firm detections of intergalactic magnetic fields in the cosmic web.

See Han (2017) for a review and Han et al. (2018) for a most recent paper.

References

- [1] J. L. Han, *Annual Review of Astronomy and Astrophysics* **55**, 111 (2017)
- [2] J. L. Han, R. N. Manchester, W. van Straten, P. Demorest, *ApJS* **in press**, (2018). arXiv: 171201997