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Cosmic ray transport in the heliosphere REINHARD SCHLICK-EISER, Ruhr University Bochum — Since the development of satellite space technology about 50 years ago the solar heliosphere is explored almost routinely by several spacecrafts carrying detectors for measuring the properties of the interplanetary medium including energetic charged particles (cosmic rays), solar wind particle densities and electromagnetic fields. In 2012 the Voyager 1 spacecraft has even left what could be described as the heliosphere modulation region, as indicated by the sudden disappearance of low energy heliospheric cosmic ray particles. As other dilute cosmic plasmas have similar densities, temperatures and magnetic fields as the solar wind, the physical processes there probably are the same. With the available in-situ measurements of interplanetary turbulent electromagnetic fields and of the momentum spectra of different cosmic ray species in different interplanetary environments, the heliosphere is the best space laboratory to test our understanding of the transport and acceleration of cosmic rays in space plasmas. I review both, the historical development and the current state of various cosmic ray transport equations. Similarities and differences to gyrokinetic transport equations for terrestrial fusion plasmas are highlighted.

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