

Astrosphere models

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Astrospheres are the stellar analogon of the heliosphere. It describes the interaction with a stellar supersonic wind with the interstellar medium. We will concentrate here on ionized stellar winds, which have already reached their supersonic terminal velocity. These winds are characterized by the ion densities, bulk velocity, temperature and the frozen-in magnetic field. Eventually, these winds interact with the interstellar medium, which is characterized by the same parameters as the stellar wind, but in addition it can contain a neutral component.

A overview of the physics of these counterflowing plasmas will be given, including ionization processes of neutrals. These latter processes, as well as radiative cooling, influence the dynamics of the flow.

Different approaches to model such interaction will be presented, i.e. hydrodynamic, magneto-hydrodynamic as well as kinetic models and will be discussed.