

Research interests for Thomas Leyser

The research is centred on mainly the interaction of powerful radio waves with the ionospheric plasma in stimulus-response type of experiments. The pump wave creates non-equilibrium conditions to which the plasma responds by turbulence of different levels of complexity. Topics include:

- Plasma turbulence and its electromagnetic emission. The magnetic field appears crucial here. In the solar system those planets with a magnetic field also radiate electromagnetically.
- Self-organization in magnetized plasma. Interaction of instabilities with multiple temporal and spatial scales. Structure formation in the plasma.
- Interaction of radio waves with aurora and other natural phenomena.
- Dust-plasma interaction, such as occurring in different atmospheric layers. The powerful radio wave is used to perturb the layers to study their response.

Concerning the overall goal of the proposed project, I think it is most interesting if we try to be open-minded and see what emerges in the discussions with all the different people, to pave the ground for creative process already at this early stage. In this way the project has a larger chance to become genuinely rooted in several different fields which furthers cross fertilization. Also, if something new can be found at this early stage then the application will be stronger.

This might be a chance to start research in dusty plasma (astro)physics, which would build on interests in both the astronomy and space physics groups.

Or why not raise the complexity of the research field of dusty plasma physics by bringing in non-equilibrium chemistry too.