

Prof. J. Liliensten

Title: Basic processes for Space Weather **Abstract.**

This class will present first the solar energy outputs. We will calculate the "solar constant" and examine how variable it is. We will then examine the solar proxies used for space weather. The second energy flux is the solar wind which will be described. A rapid overview of the magnetosphere will then be presented.

In the second part of the class, we will examine the physics of the absorptions by the Earth upper atmosphere of these two main energy inputs (outputs for the Sun, inputs for the Earth), starting with the electromagnetic flux to create the Chapman layers and then continuing with the particles. We will explain the kinetic and fluid approaches and show the effect in term of ionization, excitation, dissociation and heating.

If time is left, we will finally examine how the same processes act on the other planets.