



## Masterarbeit Astronomie, Gruppe Spaceweather:

### Design of a Flare Spectrograph

#### MOTIVATION

Flares are extremely powerful eruptions on the Sun and on stars. But so far, they are not predictable and their physics is not fully understood. We are currently designing a new instrument for our Observatory in Zimmerwald, which will be tailored to observing flares.

The instrument will record spectra over the visible wavelength range. Spectra encode the physics of objects. For example, from solar and stellar spectra one can derive the temperature, density, velocities, and magnetic fields on stars. Flare spectra, especially over the visible part of the spectrum, are rare because of observational difficulties. The goal of this project is to help designing a new instrument that will be optimized for observations of solar and stellar flares.

#### TASKS

- Learn the theory on spectroscopy, astronomical instrumentation, and observations.
- Understand fiber-fed spectrographs, their advantages and drawbacks.
- Using an optics design program (Zemax), test various potential designs of a flare spectrograph
- Write a feasibility study on the different designs
- Depending on the progress, there are options to start building the spectrograph, to visit labs that build astronomical instrumentation, or to join observations at telescopes.

