# **Planning Systems in Hubble Space Telescope**

Doing planning and scheduling for HST is a complex problem for many reasons. In a year HST can analyze thousands of targets. There are a large number of interacting constraints with timescales covering several orders of magnitude (minutes to years). The Schedule is modified constantly as observations are made.

HST implements a two level hierarchical approach for its scheduling. Scheduling has been divided in two: Long-term scheduling, which allocates observations over a 1-2 year interval, and short-term scheduling, which covers a one-week period and creates a detailed timeline of activities.

Short-term scheduling program is called Science Planning and Scheduling System (SPSS). Long-term scheduling programm is called Spike. On this text we’re going to focus on Spike.

Spike combines different techniques such as Constraint Satisfaction, Heuristics and techniques that are similar to Simulated Annealing.

Constraint Satisfaction is used to schedule observations based on several parameters. Those parameters can be: exposure, number of photographs, position of the HST (if the telescope pass through a high radiation zone), position of the target (if the target is hidden by earth or another object).

Many Hillclimbing Repair Methods and Heuristics are used in order to solve conflicts between observations. One of the heuristics used is called Min-conflicts, which moves activities to times when the number of conflicts is minimized.