LSST Scheduler Development Workshop (18-19th March, Tucson)

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Introduction.

The efficiency of the LSST scheduler will drive much of the project's scientific performance. In designing scheduler algorithms there is a substantial pool of expertise and experience that exists outside of the LSST. This expertise resides in both the astronomy community (e.g. the Spike scheduler developed at STScI) and in the academic field of operations research (e.g. the scheduling of tasks on large compute clusters or the analysis of flight and delivery operations). Typical approaches used in these fields include: hierarchical scheduling where the scheduling problem is separated into long term planning (monthly) and short term scheduling (nightly) components, the creation of grammars that can describe the constraints and cadences required by a scheduler, the development of heuristics that can simplify an optimization problem, and the implementation of a broad set of optimization techniques (e.g. linear/quadratic optimization, genetic algorithms, neural nets etc).

This workshop will last for two days and bring project personnel from Telescope (OCS), Simulations (Opsim), and Project and Science (PST), together with external experts from the field of scheduling (including those with a background in astrophysics and from industry and academia). The objective of this workshop will be to start the discussion of how the LSST scheduling problem maps to the techniques adopted by other fields, to understand which approaches might be adopted by the LSST, and to learn the best practices for developing, testing and optimizing a scheduler.

The first day will include presentations of the LSST requirements for scheduling and the current implementations together with a series of presentations on lessons learned from other scheduler development programs. The second day will be a series of discussions that will address a set of questions that have been developed by the scheduler and simulations groups related to the next stage of development.

Agenda.

Breakout groups to review morning presentations and discuss afternoon sessions. Agenda will be participant driven.

Wednesday 18th March

9:00am – 10:00am	Overview of LSST and Operations Simulations (Cook/Connolly)
10:00am – 11:00am	LSST science requirements related to scheduler development (Ivezic)
11:00am – 11:30 am	Break
11.30am – 12.30pm	The LSST scheduler algorithms (Delgardo)
12.30pm – 1.30pm	Lunch: work in smaller groups, in parallel (talks and discussion)
1.30pm – 2.30pm	Analysis tools for the scheduler (Jones)
2.30pm – 3.00pm	Lessons learned from scheduler development at Las Cumbras (Saunders)
3.00pm – 3.30pm	Lessons learned from scheduler development for JWST (Giuliano)
3.30pm – 4.00pm	Break
4.00pm – 4.30pm	Schedulers in operations research (Vanderbei)
4.30pm – 5.30pm	Discussion
6.30pm	Dinner

Thursday 19th March

9:00am – 10:00am	Required input data for the scheduler (discussion led by Reuter)
10:00am – 11:30pm	Scheduling algorithms and going beyond a simple greedy approach (discussion led by Delgardo)
11:30am – 12:30am	Development and assessment of metrics and grammars for a variety of science proposals (discussion led by Jones)
12:30pm – 1:30pm	Lunch: work in smaller groups, in parallel (talks and discussion)
1:30pm – 3:00pm	Optimizing a single cost function: is this realistic for the LSST (discussion led by Ivezic)
3:00pm	Break