TVS SURVEY STRATEGY PROPOSAL PREPARATION WORKSHOP

4-8 June 2018

Lehigh University

SOC:

Federica Bianco fbianco@nyu.edu
Sara Bonito (remote) sbonito@astropa.unipa.it
Joshua Pepper joshua.pepper@lehigh.edu
Rachel Street rstreet@lco.global

LOC:

Joshua Pepper joshua.pepper@lehigh.edu
Somayeh Khakpash somayeh.khakpash@gmail.com

REIMBURSEMENT

SOC:
Federica Bianco fbianco@nyu.edu
Sara Bonito (remote) sbonito@astropa.unipa.it
Joshua Pepper joshua.pepper@lehigh.edu
Rachel Street rstreet@lco.global

LOC:
Joshua Pepper joshua.pepper@lehigh.edu
Somayeh Khakpash somayeh.khakpash@gmail.com

Keep receipts, return them to Rachel Street rstreet@lco.global

Lunch and coffee will be served here, dinner on your own

Unconference after dinner tuesday and thurysday

MEETING MATERIAL

website https://lsst-tvssc.github.io/DDFMS_meeting_2018.html

repo https://github.com/LSST-TVSSC/TVSJune2018Workshop

all participants, please add your **GitHub** username here: goo.gl/tRdnyE
invited speakers please upload your slides on the GitHub repo:
https://github.com/LSST-TVSSC/TVSJune2018Workshop

MEETING MATERIAL

remote connection:
The workshop will be broadcasted on a blue jeans connection.
If you are joining remotely please use the **slack channel**

#tvs-2018-june-meeting

to ask questions to the speakers during presentations. The moderators will ask the question on your behalf.

Monday Wednesday Friday
https://bluejeans.com/485523198/3875?src=htmlEmail

Tuesday Thursday
https://bluejeans.com/457094386/3875?src=htmlEmail

EXTERNAL RESOURCES

OBSERVING STRATEGY WHITE PAPER

Chapter 1 and 2: overview of the considerations involved in modifying the LSST survey strategy, more details of the baseline survey strategy, and examples of some possible variations in survey strategy, implemented in various simulated surveys.

Chapter 5 and 6: the chapters on Variables and Transients respectively
live paper link : https://github.com/LSSTScienceCollaborations/ObservingStrategy

LSST Overview paper

which we just finished revising (version 5 was posted on arxiv last week)
Chapter 2.1.3 and 4.3 - *Exploring the transient sky*

OIR STUDY

2016 study to identify OIR Requirement Maximizing Science in the Era of LSST: A Community-based Study of Needed US OIR Capabilities

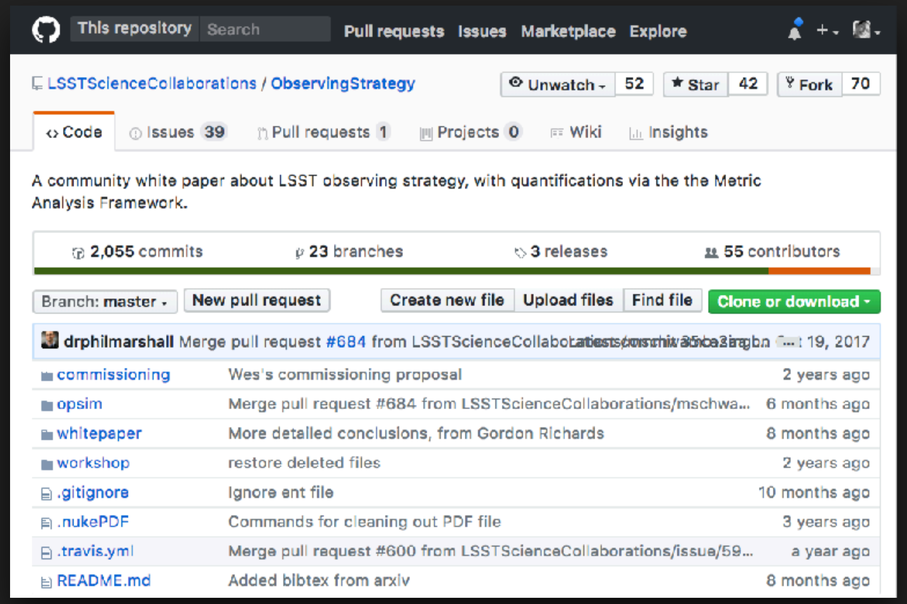
https://www.noao.edu/meetings/lsst-oir-study/files/Maximizing_Science_in_LSST_era.pdf

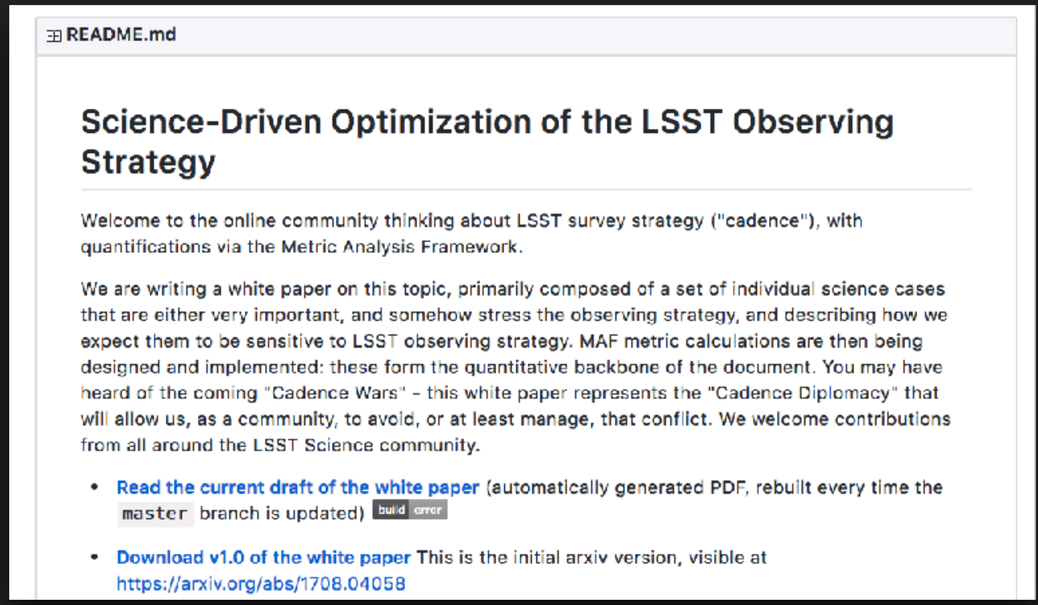
EXTERNAL RESOURCES

OBSERVING STRATEGY WHITE PAPER

Chapter 1 and 2: overview of the considerations involved in modifying the LSST survey strategy, more details of the baseline survey strategy, and examples of some possible variations in survey strategy, implemented in various simulated surveys.

Chapter 5 and 6: the chapters on Variables and Transients respectively
live paper link : https://github.com/LSSTScienceCollaborations/ObservingStrategy

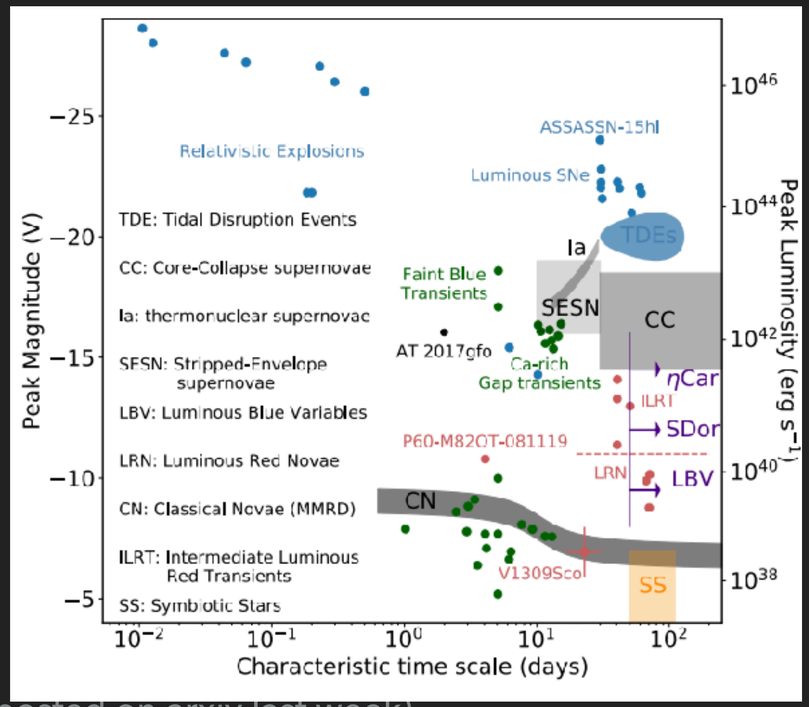




EXTERNAL RESOURCES

4.3. *Exploring the Transient Optical Sky*

Time domain science will greatly benefit from LSST's unique capability to simultaneously provide large area coverage, dense temporal coverage, accurate color information, good image quality, and rapid data reduction and classification. Since LSST extends time-volume-color space 50-100 times over current surveys (e.g., Djorgovski et al. 2013) it will facilitate new population and statistical studies and also the discovery of new classes of objects. LSST data products will enable many projects including:



LSST Overview paper

which we just finished revising (version 5 was posted on arxiv last week)

Chapter 2.1.3 and 4.3 - *Exploring the transient sky*

LSST: from Science Drivers to Reference Design and Anticipated Data Products

We describe here the most ambitious survey currently planned in the optical, the Large Synoptic Survey Telescope (LSST).

Zeljko Ivezic and 319 co-authors.

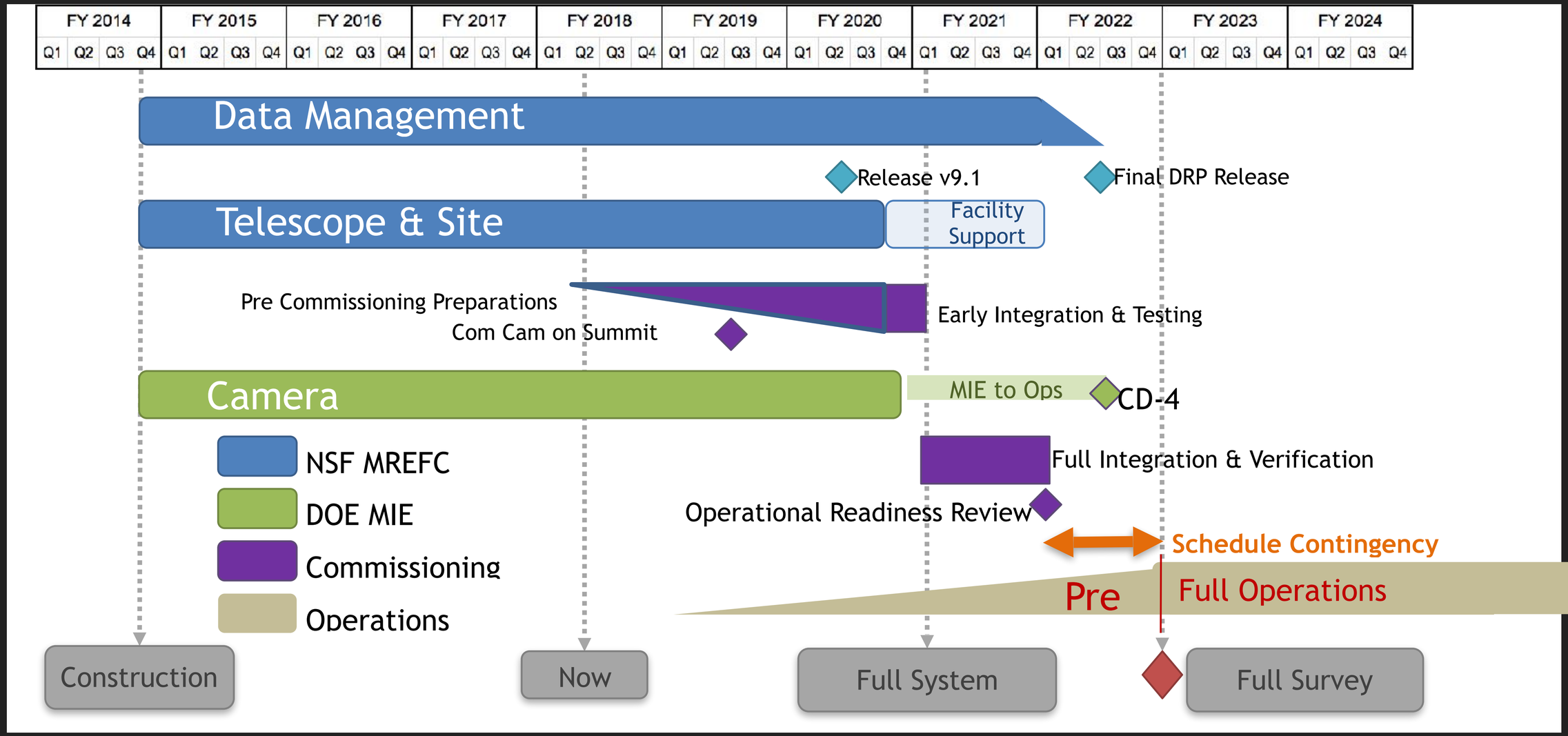
EXTERNAL RESOURCES

OIR STUDY

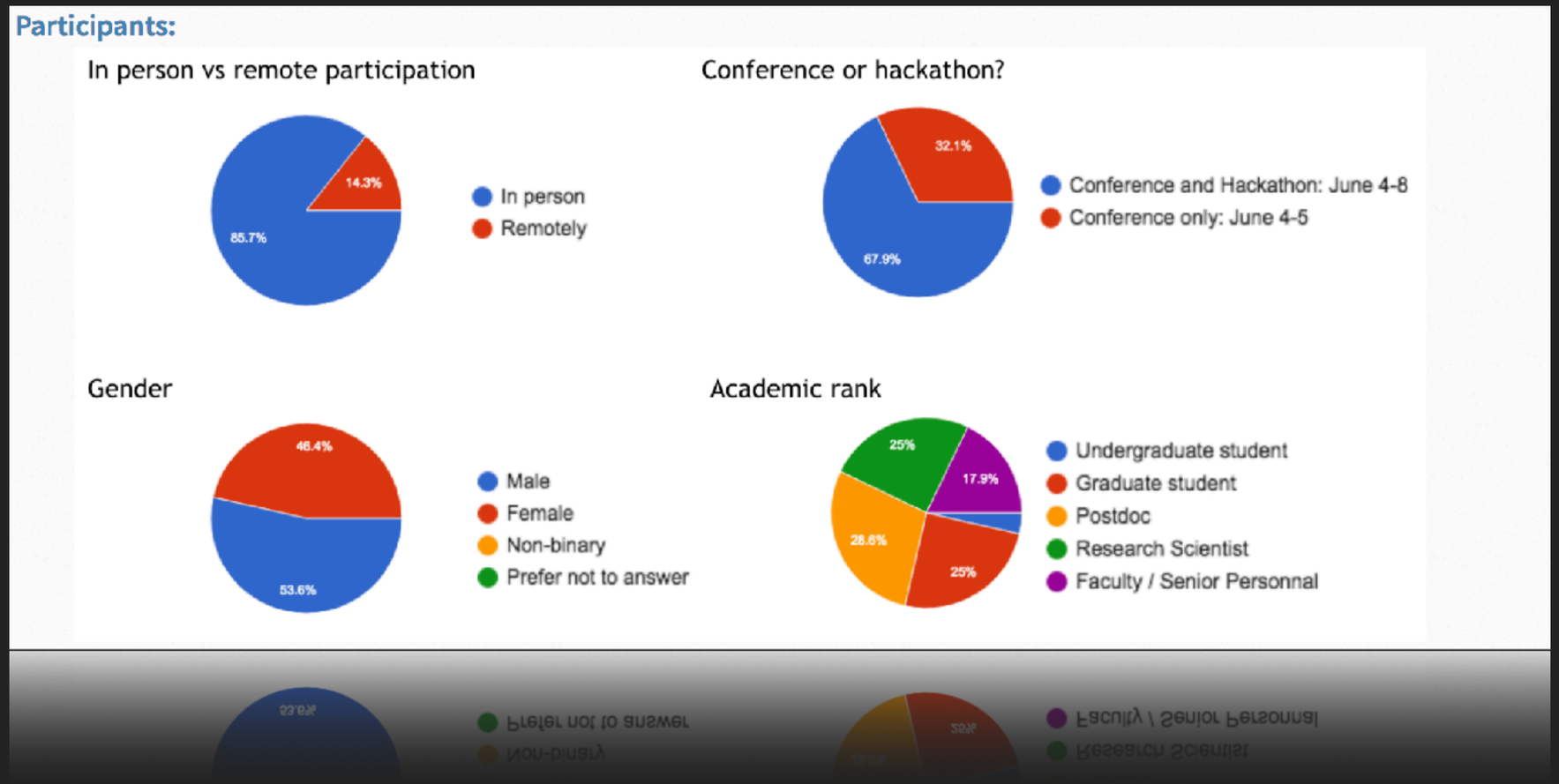
2016 study to identify OIR Requirement Maximizing Science in the Era of LSST: A Community-based Study of Needed US OIR Capabilities

https://www.noao.edu/meetings/lsst-oir-study/files/Maximizing_Science_in_LSST_era.pdf

THE ROAD TO LSST OPERATIONS



PARTICIPANTS



SCHEDULE

	June 4th	June 5th
9-930 AM	welcome, scope definition, how the workship works (what's a hackathon, what's an unconference) **FBB/RS**	recap & redesign of splinters
930-9:50 AM	proposal call review (its needed cause it will be 30 pages...) **FBB**	invited talk - alert system **Eric Bellm (LSST remote)**
9:50-10:10 AM	coffee	coffee
10:10-1030 AM	invited talk: MAF overview **Owen Boberg (LSST)**	invited talk - brokers **Monika Soraisam (NOAO)**
10:30-11 AM	splinter - goal to list science cases, review any existing metrics and identify metrics to be developed. Science areas appoint spokesperson/lead	invited talk - Alert User Interface **Rachel Street**
11-11:30 AM	splinter	splinter - recap user requirements - does UI/system fulfill science needs?
11:30- 12 PM	splinter	splinter

	June 4th	June 5th
130-2 PM	jupyter lab tutorial** FBB	MAF lab** - within science groups
2-230 PM	MAF lab** Owen Boberg	MAF lab**
230-3 PM	MAF lab**	splinter continue MAF
3-330 PM	coffee	splinter
330-4 PM	splinter - leads organize their science groups to develop MAF metrics	coffee
4-430 PM	splinter	splinter
430-5 PM	lightening talks by science group leads: observing strategy proposals	splinter
5-530 PM	discussion of synergy - can any elements be merged between different science cases? Any observing strategy overlaps?	lightening talks by science leads: observing strategy proposals
530-6 PM	discussion of synergy	discussion of synergy

legend
INVITED TALK
INTERNAL TALK
LAB
HACKATHON FINAL PRESENTATIONS
HACKATHONS AND SPLINTER SESSIONS
BREAK

SPLINTER SESSION

microlensing

LMC/SMC

variable stars

young stars

eclipsing binaries

Supernovae/Blazars

AGN

young and fast transients

non-time critical science

R tutorial on irregular time series

microlensing

LMC/SMC

variable stars

young stars

eclipsing binaries

Supernovae

AGN/Blazars

young and fast transients

non-time critical science

R tutorial on irregular time series

INVITED TALKS

Owen Boberg LSST - *MAF: Metric Analysis Framework*
Melissa Graham LSST - *Data Products*
Eric Bellm LSST - Alert System - T*he LSST Alert Stream*
Monika Soraisam NOAO - *Alert Brokers*
Rachel Street LCO - *Alert User Interface*
Eric Feigelson PennState/ISSC - *Stats and time series analysis*
Eric Gawiser Rutgers - *DESC Data Challenges*
Bryce Kalmbach DESC - *DESC Data Challenges*
Michael Johnson University of Southampton - *OpSim*
Martin Donachie University of Auckland - *OpSim (lab)*
Elle Ojala Western Washington University - *PhoSim*

speakers, add your slides to the GitHub repo https://github.com/LSST-TVSSC/TVSJune2018Workshop slides

INTERNAL TALKS

Other than this talk and the talk describing the WP proposal call (next)

YOU WILL ARE ASKED TO REPORT REGULARLY ABOUT YOUR SPLINTER SESSION/HACKATHON TEAM'S ACTIVITIES

add your slides to the GitHub repo https://github.com/LSST-TVSSC/TVSJune2018Workshop slides

LABS

we will work hands on with MAF, OpSim, PhoSim

SPLINTER SESSIONS

gather with collegeues to design WP ideas

HACKATHONS

turn ideas into Metrics and MAFs

GOAL: WRITE A WHITE PAPER ASKING FOR A SIMULATION

https://www.authorea.com/281328/NLF5iQX2Tn-gb1hAarEisA

material you use for these papers can also be included in the RoadMap

LSST TVS RoadMap Document (Draft in progress)

- Federica B Bianco (NYU Center for Urban Science & Progress)
- Rachel Street
- Paula Szkody (University of Washington)
- Kmhambleton (Villanova University)
- Moniez (LAL)
- Joshua Pepper (Lehigh University)
- Markus.Rabus (Pontificia Universidad Catolica de Chile)
- Keaton Bell
- Melissa L. Graham (University of California, Berkeley)
- Mike Lund
- Chiara.Righi
- Raiteri
- Andrej Prsa
- Maribel
- Balmaverde
- Enzo.Brocato

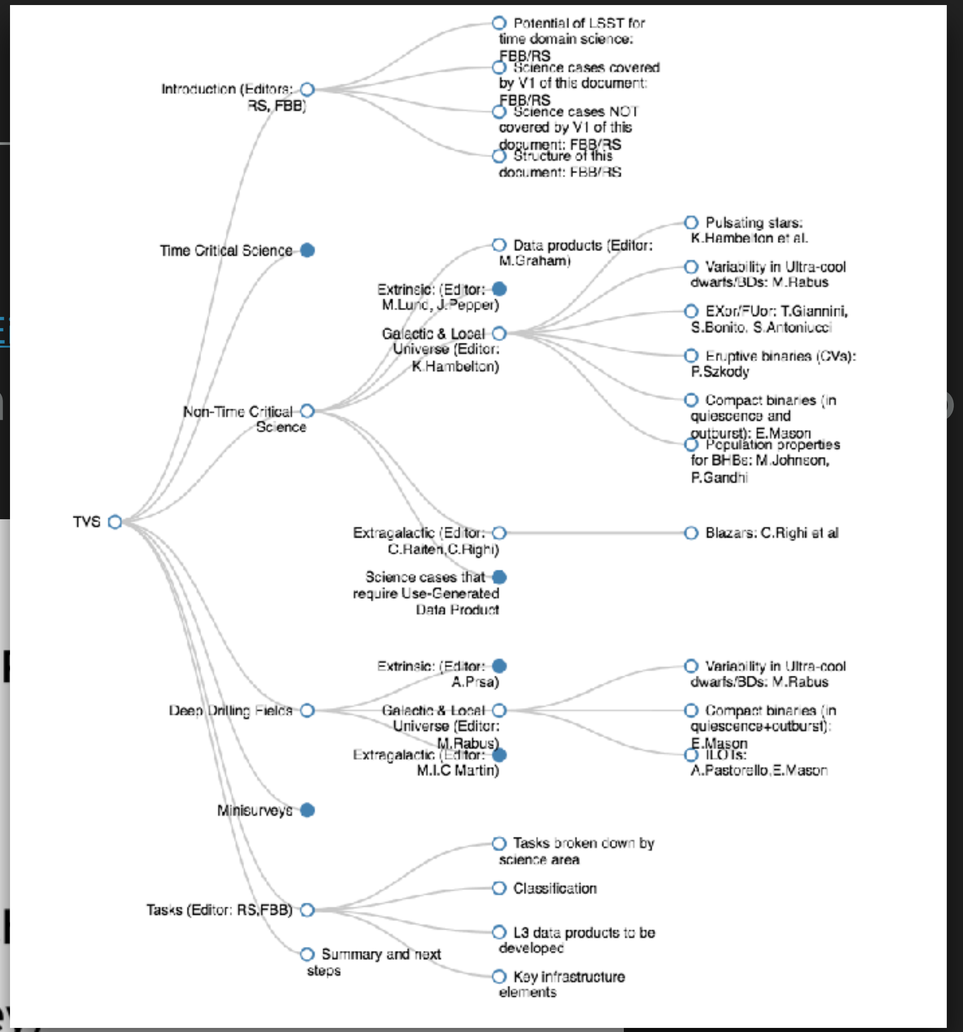
Authorea

MEETING GOALS

GOAL: WRITE A WHITE PAPER ASKING

https://www.authorea.com/281328/NLF5iQX2Tn-gb1hAarE

material you use for these papers can



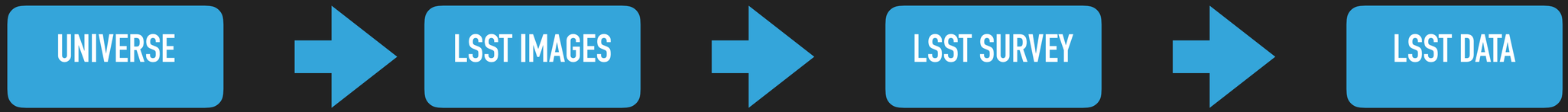
LSST TVS RoadMap Document (Draft in progress)

- Federica B Bianco (NYU Center for Urban Science &
- Rachel Street
- Paula Szkody (University of Washington)
- Kmhambleton (Villanova University)
- Moniez (LAL)
- Joshua Pepper (Lehigh University)
- Markus.Rabus (Pontificia Universidad Catolica de C
- Keaton Bell
- Melissa L. Graham (University of California, Berkele
- Mike Lund
- Chiara.Righi
- Raiteri
- Andrej Prsa
- Maribel
- Balmaverde
- Enzo.Brocato

https://www.authorea.com/users/45/articles/281328-outline-of-lsst-tvs-roadma

Authorea

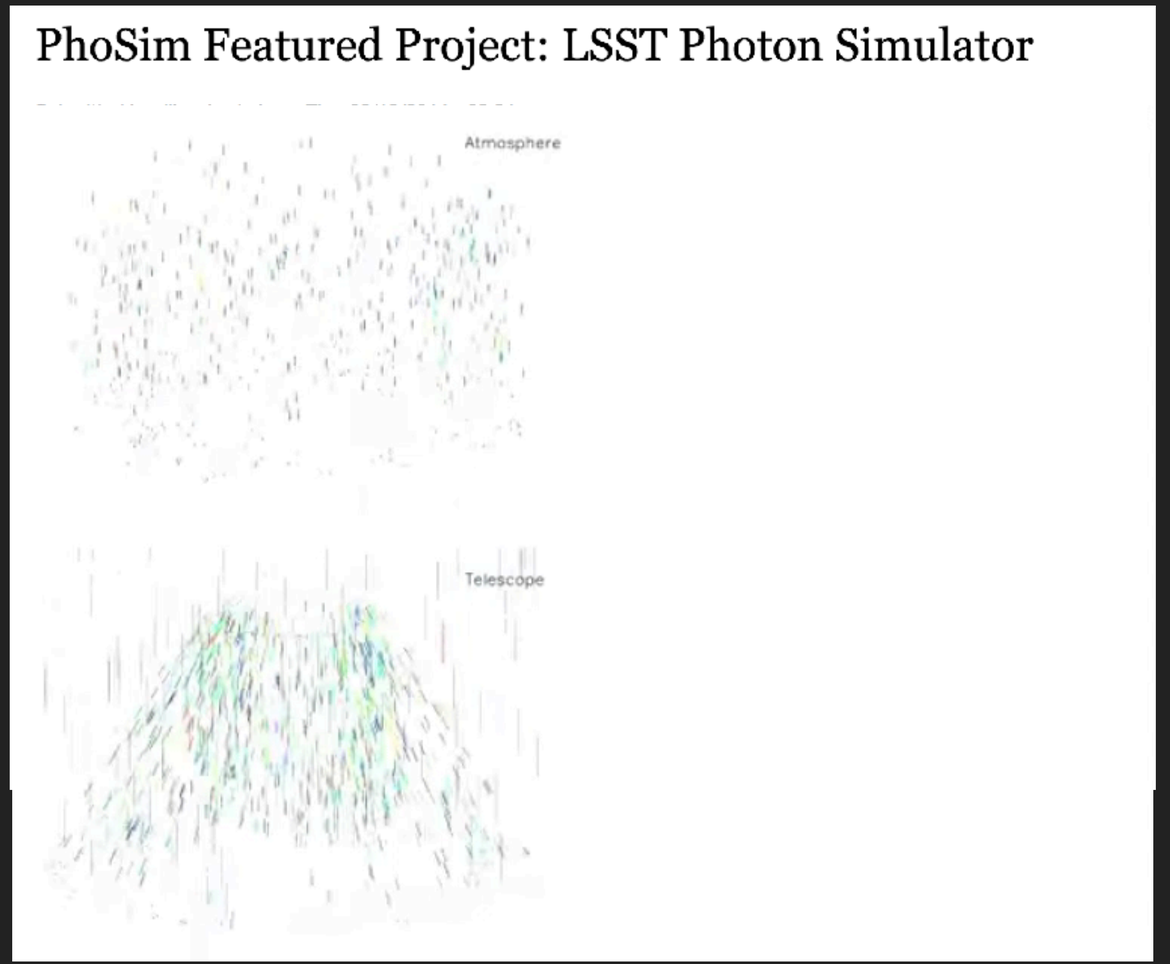
THE LSST SIMULATION ECOSYSTEM



Simulate LSST images ⟶ *PhoSim*

The Photon Simulator (PhoSim) is a code to simulate high fidelity astronomical images from optical telescopes. PhoSim uses a novel photon Monte Carlo approach to simulate the propagation of light through the atmosphere, telescope, and camera. An arbitrary catalog of astronomical sources and their properties is the input to PhoSim.

Alternative telescopes can be implemented in PhoSim, but it was specifically designed for simulations of the Large Synoptic Survey Telescope (LSST).



Author: John Peterson

http://lsst-desc.org/node/33

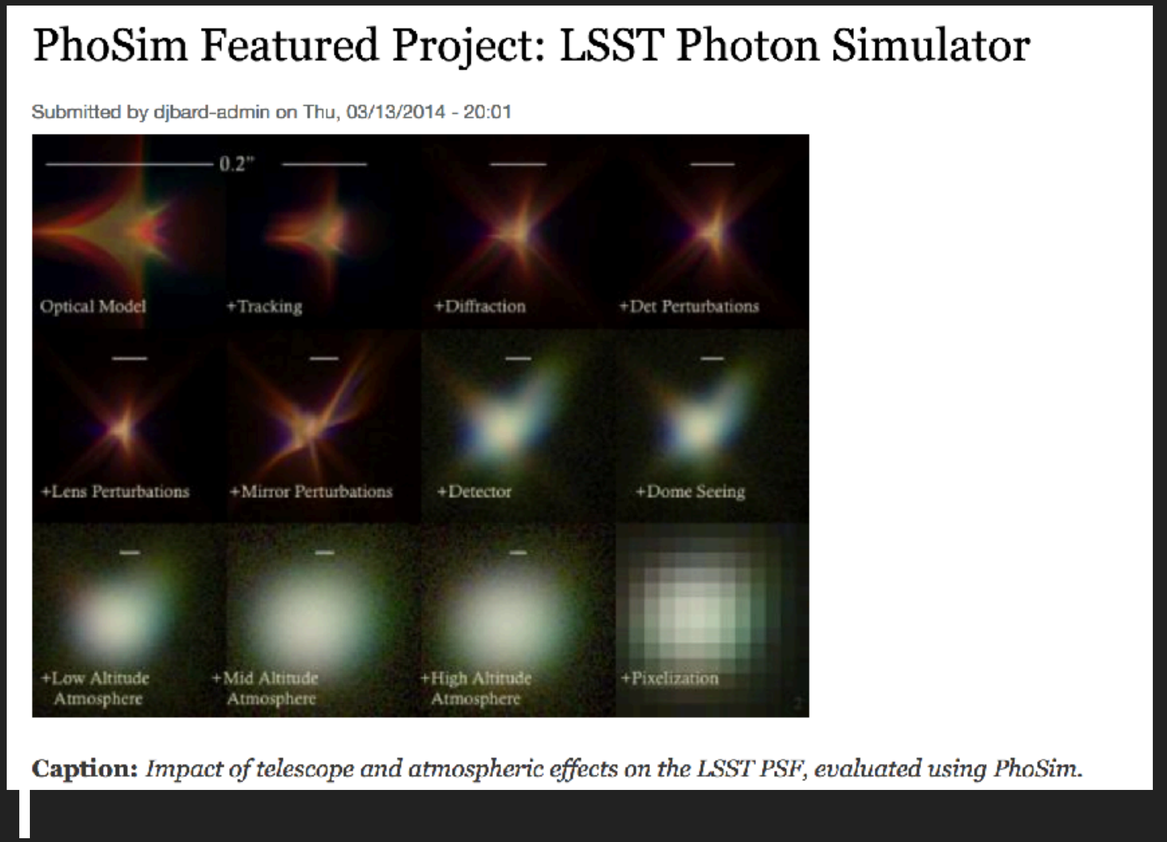
Simulate LSST images ⟶ *PhoSim*

The Photon Simulator (PhoSim) is a code to simulate high fidelity astronomical images from optical telescopes. PhoSim uses a novel photon Monte Carlo approach to simulate the propagation of light through the atmosphere, telescope, and camera. An arbitrary catalog of astronomical sources and their properties is the input to PhoSim.

Alternative telescopes can be implemented in PhoSim, but it was specifically designed for simulations of the Large Synoptic Survey Telescope (LSST).

Author: John Peterson

http://lsst-desc.org/node/33



Simulate LSST images ⟶ *PhoSim*

Example usage:

- **A one night movie of LMC: A highly valuable data set for technical tests (repetability) and scientific purpose (short time-scale variability search)**
- prototype LSST devices in laboratories
- the primary mirror shapes tests for LSST
- the LSST calibration telescopes
- simulate a realistic sky to be obeserved by LSST to test LSST pipeline
- test pipeline in special conditions (e.g. crowded fields, near mag limit, near saturation limit)

Simulate LSST images ⟶ *PhoSim*

PhoSim resources

LSST website overview:

https://www.lsst.org/scientists/simulations/phosim

http://lsst-desc.org/node/33

Documentation:

https://bitbucket.org/phosim/phosim_release/wiki/Home

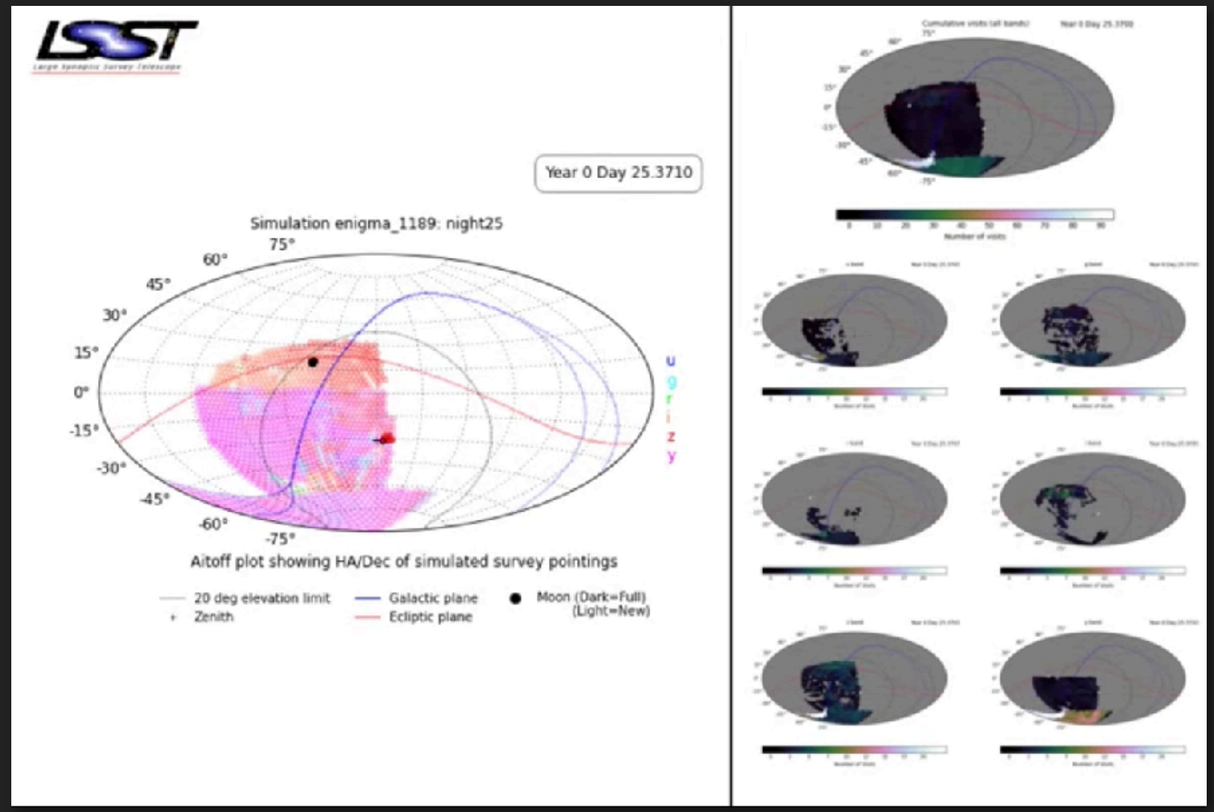
Questions: John Peterson at Purdue www.diagrid.org

talk by Elle Ojalae - on Friday

https://community.lsst.org/t/photsim-introduction-video/2149

Simulate LSST images → *PhoSim*
Simulate LSST survey → *OpSim*

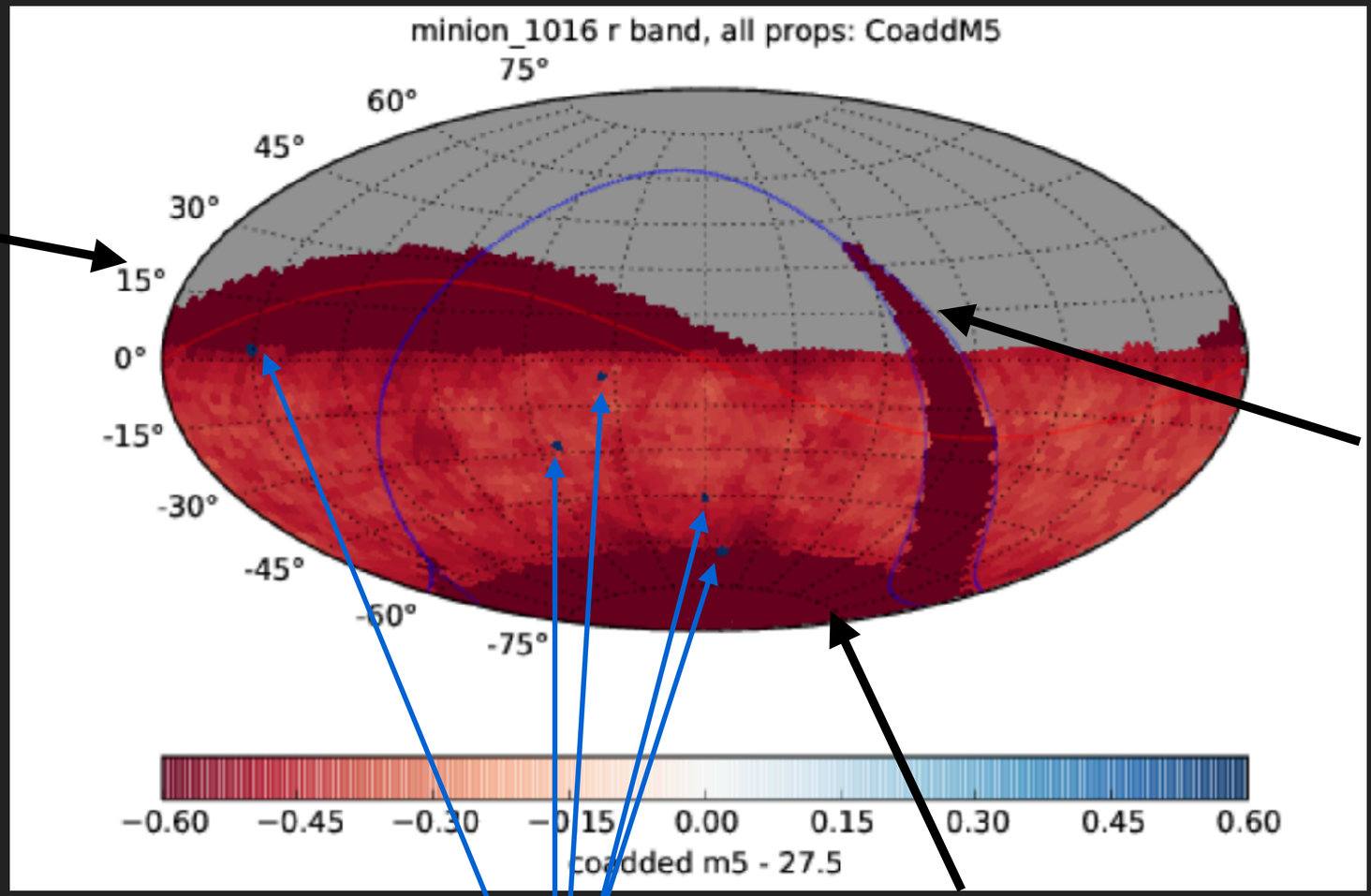
The Operations Simulator (OpSim) is an application that simulates the field selection and image acquisition process of the LSST over the 10-year life of the planned survey. Each visit or image of a field in a particular filter is selected by combining science program requirements, the mechanics of the telescope design, and the modeled environmental conditions. The output of the simulator is a detailed record of the telescope movements and a complete description of the observing conditions as well as the characteristics of each image.



Author: A. Connely++

https://www.lsst.org/scientists/simulations/opsim

North Ecliptic Survey
The NES is an extension to reach the Ecliptic at higher airmass than the WFD survey typically covers, no *u*



Galactic Plane (1.7%): covers the region where LSST is expected to be highly confused by the density of stellar sources; fewer total exposures/field and does **not collect in pairs**

Wide-Fast-Deep (85.1%)

Deep Drilling Fields DDF (4.5%)

South Celestial Pole (2.2%): higher airmass decl>−65 degrees. includes *ugrizy*, but takes fewer exposures/field than the WFD and does **not collect in pairs**.

Available Simulations

OPSIM

minion_1012	*Uniform cadence (**WFD**), which asks for **visits in pairs**, and no other proposal.*
minion_1013	*Only uniform cadence (**WFD**), but does **not require pairs of visits.***
kraken_1043	*As the baseline cadence (Setup 0), but **does not require pairs of visits.***
enigma_1281	*As the baseline cadence, but requests **3 visits per WFD** field chosen instead of 2 visits, using the same window function for both 1-2 visits and 2-3 visits.*
kraken_1045	*As the baseline cadence, except that the **u-band exposure time is 60 sec** instead of 30 sec.; Nvisit for the u-band remains the same.*
kraken_1059	*As the baseline cadence, except that the **u-band exposure time is 60 sec** instead of 30 sec; **Nvisit for the u-band is decreased by a factor of 2**.*
kraken_1052	*As the baseline cadence, except for a **shorter visit exposure time: 20 sec** instead of 30 sec. Deep drilling proposal has visits based on 30sec exposure due to code issues.*
kraken_1053	*As the baseline cadence, except for a **longer visit exposure time: 60 sec** instead of 30 sec.*
minion_1020	***Pan-STARRS-like Cadence** - This is the uniform cadence, and no other proposal, keeping pairs of visits, but **increase the area to include everything with Dec <+15 deg (~27,400 deg2), keeping the default airmass limit of 1.5.***
minion_1018	*As the baseline cadence, except for the more **relaxed airmass limit of 2.0** instead of 1.5.*
minion_1022	*As Setup1 (**uniform cadence** with no other proposal), except for the m**ore relaxed airmass limit of 2.0** instead of 1.5.*
minion_1017	*As Setup 1 (**uniform cadence** with no other proposal), except for the **more stringent airmass limit of 1.3** instead of 1.5.*

https://www.lsst.org/scientists/simulations/opsim/opsim-v335-benchmark-surveys

Available Simulations

OPSIM

astro-lsst-01_2013	V4 features	Cadence	10 yr, HAbonus 0.5, HAmax 3, all props	astro-lsst-01_2013.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2013/cadence	4.1.0.9	2017-09-29	2.6.0+	2018-03-07
astro-lsst-01_2013	V4 features	SRD	10 yr, HAbonus 0.5, HAmax 3, all props	astro-lsst-01_2013.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2013/srd	4.1.0.9	2017-09-29	2.6.0+	2018-03-07
astro-lsst-01_2013	V4 features	Standard	10 yr, HAbonus 0.5, HAmax 3, all props	astro-lsst-01_2013.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2013/all	4.1.0.9	2017-09-29	2.6.0+	2018-03-07
astro-lsst-01_2016	V4 features	Cadence	All defaults again	astro-lsst-01_2016.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2016/cadence	4.1.0.10	2017-10-23	2.6.0+	2018-03-07
astro-lsst-01_2016	V4 features	SRD	All defaults again	astro-lsst-01_2016.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2016/srd	4.1.0.10	2017-10-23	2.6.0+	2018-03-07
astro-lsst-01_2016	V4 features	Standard	All defaults again	astro-lsst-01_2016.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2016/all	4.1.0.10	2017-10-23	2.6.0+	2018-03-07
astro-lsst-01_2020	V3-ish	Cadence	Turn off all new features	astro-lsst-01_2020.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2020/cadence	4.1.0.10	2017-10-31	2.6.0+	2018-03-07
astro-lsst-01_2020	V3-ish	SRD	Turn off all new features	astro-lsst-01_2020.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2020/srd	4.1.0.10	2017-10-31	2.6.0+	2018-03-07
astro-lsst-01_2020	V3-ish	Sched (old)	Turn off all new features	astro-lsst-01_2020.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2020/sched	4.1.0.10	2017-10-31	2.6.0+	2018-03-07
astro-lsst-01_2020	V3-ish	Sci (old)	Turn off all new features	astro-lsst-01_2020.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2020/sci	4.1.0.10	2017-10-31	2.6.0+	2018-03-07
astro-lsst-01_2020	V3-ish	Standard	Turn off all new features	astro-lsst-01_2020.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2020/all	4.1.0.10	2017-10-31	2.6.0+	2018-03-07
astro-lsst-01_2021	V4 features	Cadence	HA max 6.0	astro-lsst-01_2021.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2021/cadence	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
astro-lsst-01_2021	V4 features	SRD	HA max 6.0	astro-lsst-01_2021.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2021/srd	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
astro-lsst-01_2021	V4 features	Sched (old)	HA max 6.0	astro-lsst-01_2021.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2021/sched	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
astro-lsst-01_2021	V4 features	Sci (old)	HA max 6.0	astro-lsst-01_2021.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2021/sci	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
astro-lsst-01_2021	V4 features	Standard	HA max 6.0	astro-lsst-01_2021.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2021/all	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	Cadence	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/cadence	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	SRD	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/srd	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	Sched (old)	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/sched	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	Sci (old)	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/sci	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	SeeingMaps	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/years	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	Slew	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/slew	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
baseline2018a	V4 baseline	Standard	HA bonus 0.3 (HAmax 3.0)	baseline2018a.db.gz	ResultsDb	/local/lsst/opsim/baselines/astro-lsst-01_2022/all	4.1.0.10	2017-11-01	2.6.0+	2018-03-07
colossus_2328	V4 features	Cadence	10yrs, all props, 0.0 airmass bonus, 0.05 HA bonus	colossus_2328.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2328/cadence	4.1.0.10	2017-10-25	2.6.0+	2018-03-07
colossus_2328	V4 features	SRD	10yrs, all props, 0.0 airmass bonus, 0.05 HA bonus	colossus_2328.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2328/srd	4.1.0.10	2017-10-25	2.6.0+	2018-03-07
colossus_2328	V4 features	Standard	10yrs, all props, 0.0 airmass bonus, 0.05 HA bonus	colossus_2328.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2328/all	4.1.0.10	2017-10-25	2.6.0+	2018-03-07
colossus_2378	V4 features	Cadence	10yrs, all props, 0.0 airmass bonus, 0.8 HA bonus	colossus_2378.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2378/cadence	4.1.0.10	2017-11-03	2.6.0+	2018-03-07
colossus_2378	V4 features	SRD	10yrs, all props, 0.0 airmass bonus, 0.8 HA bonus	colossus_2378.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2378/srd	4.1.0.10	2017-11-03	2.6.0+	2018-03-07
colossus_2378	V4 features	Standard	10yrs, all props, 0.0 airmass bonus, 0.8 HA bonus	colossus_2378.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2378/all	4.1.0.10	2017-11-03	2.6.0+	2018-03-07
colossus_2432	V4 features	Cadence	10yrs, all props, only time balancing	colossus_2432.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2432/cadence	4.1.0.10	2017-12-01	2.6.0+	2018-03-07
colossus_2432	V4 features	SRD	10yrs, all props, only time balancing	colossus_2432.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2432/srd	4.1.0.10	2017-12-01	2.6.0+	2018-03-07
colossus_2432	V4 features	Sched (old)	10yrs, all props, only time balancing	colossus_2432.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2432/sched	4.1.0.10	2017-12-01	2.6.0+	2018-03-07
colossus_2432	V4 features	Sci (old)	10yrs, all props, only time balancing	colossus_2432.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2432/sci	4.1.0.10	2017-12-01	2.6.0+	2018-03-07
colossus_2432	V4 features	Standard	10yrs, all props, only time balancing	colossus_2432.db.gz	ResultsDb	/local/lsst/opsim/baselines/colossus_2432/all	4.1.0.10	2017-12-01	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	Cadence	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/cadence	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (old sky)	Cadence	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_oldsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_oldsky/cadence	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	SRD	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/srd	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (old sky)	SRD	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_oldsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_oldsky/srd	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	Sched (old)	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/sched	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (old sky)	Sched (old)	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_oldsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_oldsky/sched	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	Sci (old)	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/sci	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (old sky)	Sci (old)	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_oldsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_oldsky/sci	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	SeeingMaps	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/years	3.3.5	2015-12-31	2.6.0+	2018-03-07
minion_1016	V3 baseline (new sky)	Standard	baseline (enigma1189/ewok1004) w/v3.3.5	minion_1016_newsky.db.gz	ResultsDb	/local/lsst/opsim/baselines/minion_1016_newsky/all	3.3.5	2015-12-31	2.6.0+	2018-03-07

http://astro-lsst-01.astro.washington.edu:8081/

Simulate LSST images → *PhoSim*

Simulate LSST survey → *OpSim*

Example usage:

- **Test the performance of a strategy before proposing it for consideration through the White Papers Proposal Call**
- **Fast Transients: GRB, GW,.... may need specific attention, especially in the broker**
- **Target of Opportunities in the Multi-messenger GW era: task force aimed at understanding what can be the role of LSST in the GW era**
- **simulate a realistic sky to be observed by LSST to test LSST pipeline**
- **test pipeline in special conditions (e.g. crowded fields, near mag limit, near saturation limit)**
- **prototype LSST devices in laboratories**
- the primary mirror shapes tests for LSST
- the LSST calibration telescopes

Simulate LSST images → ***PhoSim***

Simulate LSST survey → ***OpSim***

OpSun resources

LSST website overview:
https://www.lsst.org/scientists/simulations/opsim

Documentation:
https://confluence.lsstcorp.org/display/SIM/SOCS-Scheduler+Capabilities

Questions: https://community.lsst.org/c/sims

talk by Michael Johnson, lab by Martin Donachie - Thursday
slides by A. Connely for SC chairs meeting (03/2017)

https://project.lsst.org/groups/sac/sites/lsst.org.groups.sac/files/OpSim%20Status%202017_0.pdf

Simulate LSST images → ***PhoSim***

Simulate LSST survey → ***OpSim***

Simulate how LSST would see your transients → ***MAF***

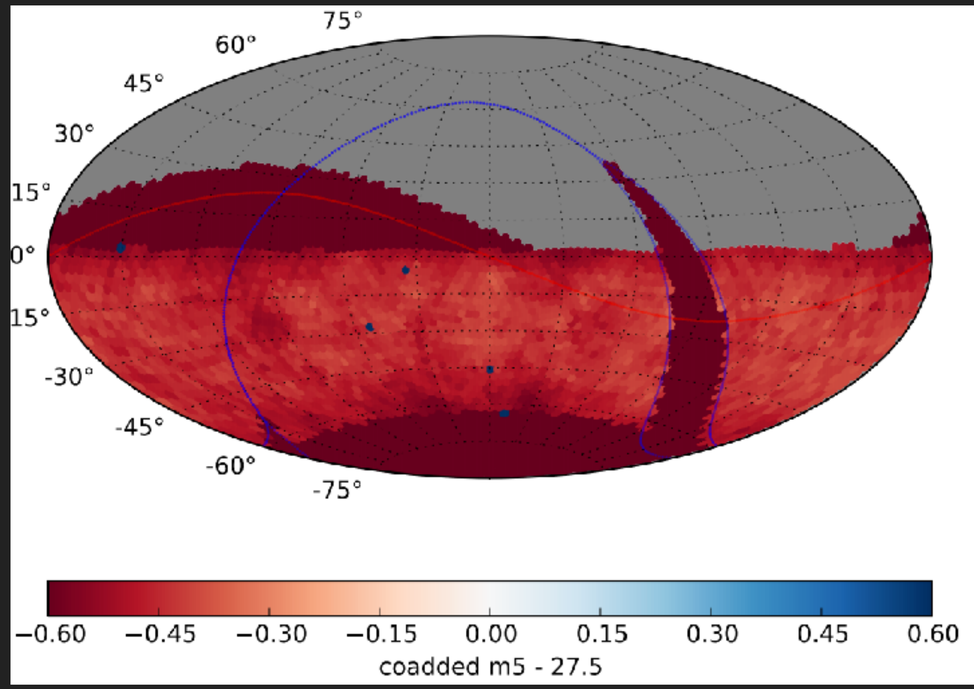
Simulate LSST images → ***PhoSim***

Simulate LSST survey → ***OpSim***

Simulate how LSST would see your transients → ***MAF***

MAF reads the pointing history of the LSST generated by the OpSim, enables the subdivision of these pointings based on position on the sky (RA/Dec, etc.) or characteristics of the observations (e.g. airmass or sky brightness) and a calculation of how well these observations meet a specified science objective (or metric).

An example metric could be expected astrometric photometric precision, r&g within 1 hour. The output of these metrics can be generated for a full survey, for specified time intervals, or regions.



Author: Jones & Yoachim

https://www.lsst.org/scientists/simulations/maf

MAF API

Metric Analysis Framework (Peter Yoachim, Lynne Jones)

Written in python
Example library developed as *jupyter notebooks*

Getting Help in MAF

This notebook is a collection of snippets of how to get help on the various bits of the **MAF** ecosystem. It shows some of the **MAF**
also uses the `help` function. The `help` function used below is a Python standard library function. It can be used on any module, c
should give clarity to the parameters used in associated functions. It will also list functions associated with modules and classes.
`dir` command which is another Python standard library function. This is useful for getting a list of names from the target object (m

In [1]:
```
# Need to import everything before getting help!
import lsst.sims.maf
import lsst.sims.maf.metrics as metrics
import lsst.sims.maf.slicers as slicers
import lsst.sims.maf.stackers as stackers
import lsst.sims.maf.plots as plots
```

In [2]:
```
# Show the list of metrics with a little bit of documentation
metrics.BaseMetric.list(doc=True)
```

```
----  AveSlewFracMetric  ----
None
----  BinaryMetric  ----
Return 1 if there is data.
----  Coaddm5Metric  ----
Calculate the coadded m5 value at this gridpoint.
----  CompletenessMetric  ----
Compute the completeness and joint completeness
----  CountMetric  ----
```

next talk and lab by Owen Boberg, TODAY

http://sims-maf.lsst.io.

https://github.com/LSST-nonproject/

STRAWMAN WHITE PAPER PLAN

1. Describe your science case

STRAWMAN WHITE PAPER PLAN

1. Describe your science case

2. Design Figure of Merit (FOM) to quantify LSST's cadences performance with a single number

STRAWMAN WHITE PAPER PLAN

1. Describe your science case

2. Design Figure of Merit (FOM) to quantify LSST's cadences performance with a single number

2a. **Design a MAF if needed**
(but so many are already available!)

STRAWMAN WHITE PAPER PLAN

1. Describe your science case

2. Design Figure of Merit (FOM) to quantify LSST's cadences performance with a single number

2a. **Design a MAF if needed**
(but so many are already available!)

3. Envision and describe a survey strategy that would answer your science question

STRAWMAN WHITE PAPER PLAN

1. Describe your science case

2. Design Figure of Merit (FOM) to quantify LSST's cadences performance with a single number

2a. **Design a MAF if needed**
(but so many are already available!)

3. Envision and describe a survey strategy that would answer your science question

4. Talk to other teams to identify science cases benefitting from similar strategies and merge WPs