## **Rubin Observatory**

# **Developing Rubin Software**



## Background



- Developer Guide is source of truth (<a href="https://developer.lsst.io">https://developer.lsst.io</a>)
  - Has the coding style
  - Describes the development process.

- For a concise overview of the development process see 2018 SPIE paper:
  - Document-28452
  - aka doi:10.1117/12.2312157

#### **Development Basics**



- Python >=3.7 (3.8 soon) and C++14.
- Manage work through Jira with bugs, stories, and epics.
- Git repositories on GitHub in two organizations (<u>lsst</u>, and <u>lsst-dm</u>).
- All work is done on branches named after the Jira ticket (tickets/DM-1234).
- All code must be reviewed by at least one person (some exceptions).
- Reviews done on GitHub pull requests but approved on Jira
- We use master as our deployment branch.
- Ticket branches are rebased before merging to master.

## Why do we rebase?



87d979c	Some minor improvements to coordinates landing docs
217c773	Merge pull request #6326 from adrn/coordinates/fix-separation-diffs
cb2458d	Merge pull request #15 from eteg/coordinates/fix-separation-diffs
9ddc5b8	Alternate implementation using without_differentials
cfe918e	make frame.separation_3d work even if frames have velocity data
acb4bfe	Merge pull request #6325 from astrofrog/fix-sphinx-templates-tarfile
ab6969d	Make sure we include the .rst templates from astropy-helpers in the
6deddbb	Merge pull request #6330 from adrn/coordinates/fix-uvw
5a13166	add changelog entry for 6330
5497f43	fix skycoord test that uses old ordering
45cb5db	update cartesian names
8fbb330	Merge pull request #6329 from adrn/coordinates/fix-frame-slicing
2ad6fa0	add test to check that slicing prserves diff class
e5f99d3	fixes #6327 - carry along differential_cls inapply
f89f3d9	Merge pull request #6317 from adrn/coordinates/diff-class-init
e14210f	added bit about differential_cls to docstrings [docs only]
f3ab348	add test of setting differential class in init
84e6532	allow passing a differential class or dict of classes to basecoordinat
5155eb3	Merge pull request #6299 from eteq/add-numfocus-badge
beb613b	add alt texts
5c8e88a	add Powered by NomFOCUS badge
18a0950	Merge pull request #6305 from pllim/fix-samp
0f93072	Fix samp_hub entry-point. Fix deprecation warning typo.
1240cda	Merge pull request #6296 from pllim/ignore-mask-comment
8ba70cb	Added inline comment about removing MaskedArrayFutureWarning
f59119e	Merge pull request #6306 from adrn/coordinates/fix-lsr-velocity
63d9e44	fix in docstring example too
22097c1	fix UVW velocities
2e8948d	Merge pull request #6307 from dhomeier/lxml-getargspec
91fcb5c	TST: fix non-intercepted warnings from lxml in Python 3.6
e176eff	Merge pull request #6295 from bsipocz/setup_add_cython_jinja
253f671	Adding Cython and Jinja2 to setup_requires as in fact they are requi
ae7fdf1	Adding back python version limitation to 3.5 for the RTD builds
28d2a0c	Merge pull request #6294 from saimn/travis-test-duration
c76ad73	Show test duration for the slowest tests
d063d13	Merge pull request #6289 from adrn/coordinate/repr-fix
704 007	· · · · · · · · · · · · · · · · · · ·

All	Local "master"
Short SHA	Subject
91bfccb	w.2018.11 Merge branch 'tickets/DM-13655'
1d5fd08	
c8ca3e2	tickets/DM-13655 origin/tickets/DM-13655 Phase out pex::exceptions::MemoryError.  Merge branch 'tickets/DM-13788'
6413135	
62bd50a	· · · · · · · · · · · · · · · · · · ·
fbf2208	o remove dbStorage use from ExposureFormatter
c4da012	Merge pull request #328 from lsst/tickets/DM-13750
	tickets/DM-13750 origin/tickets/DM-13750 Move BaseRecordstr_ implementation to C++.
c2958ee	Merge branch 'tickets/DM-13129'
cf3c4ef	tickets/DM-13129 origin/tickets/DM-13129 Stop trying to set None value if default unknown
2e4184d	v15.0.rc1 w.2018.10 Merge branch 'tickets/DM-13680'
0dae580	tickets/DM-13680 origin/tickets/DM-13680 Test the SkyWcs(FrameDict) constructor
ad45ac6	Update test_skyWcs.py to test TAN-SIP persistence
03b8c38	Add bbox arg to SkyWcsBaseTestCase.checkPersistance
a6b0709	Merge branch 'tickets/DM-13534'
bf9fc95	tickets/DM-13534 origin/tickets/DM-13534 Remove unnecessary NumPy C API usage.
af69380	Fix array template parameters.
d12f74c	Rewrite customization of Angle column conversions.
19103d3	w.2018.09 Merge branch 'tickets/DM-10411'
4f3b790	tickets/DM-10411 origin/tickets/DM-10411 Remove special TIMESYS handling in readFitsWcs
0115757	Merge branch 'tickets/DM-12447'
607a0d2	origin/tickets/DM-12447 Update cameraGeom.dox for new API
b16a45d	O Implement RFC-392: Camera & Detector API changes
6b2845b	Fix doxygen warning in camera.py
055735b	O Clang-format detector.cc

Rubin Observatory Operations Boot Camp 2020 October 13

#### **EUPS** and **SCons**



- eups is an environment manager used by Science Pipelines developers.
- Don't panic!
- Like git, a few commands will take you a long way:
  - eups list lsst\_distrib
  - setup lsst\_distrib
  - cd \$MY\_WORK\_DIR
  - setup -k -r .
  - scons j4

## Continuous Integration



- Use CI integration with GitHub (migrating from Travis to GitHub Actions)
  - Run flake8 tool to ensure style compliance.
  - Can also do other checks if required (eg run mypy).
  - Enable branch protections to require that branches are up to date before merging. (never hit the "update branch" button on GitHub!).
- Use Jenkins for integration/unit testing.
  - Use pytest as the test runner (but unittest for tests themselves).
  - <u>ci.lsst.codes</u> lists all the options. stack-os-matrix is the common one for testing science pipelines.
  - Must pass before merging branch. (usually lsst\_distrib + lsst\_ci for science pipelines).

## **DEMO**



Rubin Observatory Operations Boot Camp 2020 October 13 7