Rubin Observatory

Science Pipelines Milestones

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NSF AURA U.S. DEPARTMENT OF ENERGY | Office of Science SLAC CHARLES AND LISA SIMONYI FUND FOR ARTS AND SCIENCES LSST CORPORATION

5 overdue milestones, 10 due in the next 3 mo.

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- *"This represents an initial capability, providing realistic interfaces, data-flows and products; ongoing refinement of the algorithm being used is expected."*
- Milestones are unequivocally construction. When we transition them to "in maintenance, we are open to work on them with Commissioning or Ops hats on
- Most can be claimed in the next 6 mo, ***except***:
  - DM-DRP-29: proper motion/parallax est. 4/2022
  - DM-DRP-13, DM-DRP-24 PSF Estimation est. ?
  - DM-DRP-31: Photo-z est. TBD
  - DM-DRP-35: Multiband measurement est. later 2021
  - DM-DRP-25: Coaddition for Measurement est. 2022
- Looking at just the milestones, most look fine to complete before mid-2023 (detail in a few slides) but….

Milestones

In practice, our "truth" document for what is left to complete has been the DPDD

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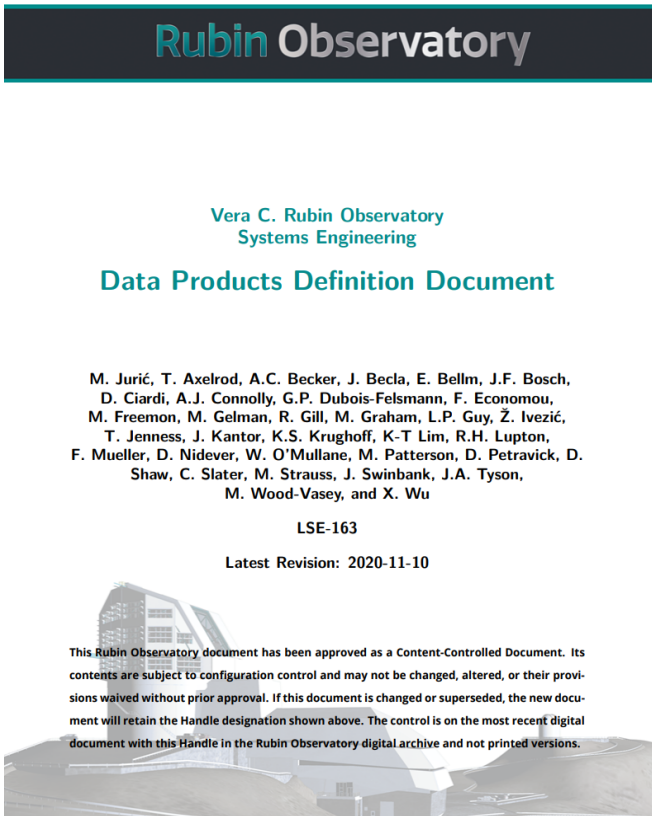
- Every December, the Science Pipelines Product Owners review what is left
- A year ago, we saw that we **would not finish** everything by October 2022
- And undertook the project of categorizing every work package by how critical that it was done before DR1



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Vera C. Rubin Observatory
Systems Engineering

Data Products Definition Document

M. Jurić, T. Axelrod, A.C. Becker, J. Becla, E. Bellm, J.F. Bosch, D. Ciardi, A.J. Connolly, G.P. Dubois-Felsmann, F. Economou, M. Freemon, M. Gelman, R. Gill, M. Graham, L.P. Guy, Ž. Ivezić, T. Jenness, J. Kantor, K.S. Krughoff, K-T Lim, R.H. Lupton, F. Mueller, D. Nidever, W. O'Mullane, M. Patterson, D. Petravick, D. Shaw, C. Slater, M. Strauss, J. Swinbank, J.A. Tyson, M. Wood-Vasey, and X. Wu

LSE-163

Latest Revision: 2020-11-10

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Outstanding Work Packages per DPDD as of January 2020

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	A	B	C	D	E	F	G	H
1	**Related Milestone**	**Flag**	**Name**	**Importance**	**Difficulty/risk**	**dependencies**	**Status**	**Construction-End?**
2		object-centroids	**Object Centroids**	10	1	['deblending', 'sourc	Per-band cer	We are confident
3		object-aperture-fluxes	**Object Aperture Fluxes**	10	1	['deblending']	This uses the	See \ref{flag:sou
4	DM-DRP-28	drp-diffim	**Image Differencing in DRP**	10	2	[]	While DRP h	DRP will perform
5		object-adaptive-moments	**Object Adaptive Moments**	10	2	['deblending', 'sourc	Per-band ada	Regularization w
6		source-centroids	**Source Centroids**	10	3	['chromatic-psfs']	A mature sin	Final-catalog cen
7		source-aperture-fluxes	**Source Aperture Fluxes**	10	4	[]	Circular aper	Update the DPDD
8		relative-astrometry-scaling	**Performance Scaling in Relative A**	10	6	[]	The first atte	Either we will dro
9	DM-DRP-35	multi-band-measurement	**Multi-Band Measurement**	10	6	['measurement-coad	Algorithms th	This must be don
10	DM-DRP-22	templates	**DiffIm Templates from DRP**	10	6	[]	Templates ar	Templates will be
11		subtract-bright-stars	**Subtract Bright Star Wings**	10	8	[]	We have bee	We plan to do thi
12		galaxy-model-fitting	**Galaxy Model Fitting**	9	3	['deblending', 'objec	Galaxy fitting	Integrating \textt
13	DM-DRP-27	drp-dia-association	**DIASource-DIAObject Associatio**	9	4	['drp-diffim']	DIASource-D	DRP will impleme
14	DM-DRP-25	measurement-coaddition	**Coaddition for Measurement**	9	5	[]	Our approac	Now that we plar
15		standard-colors	**Standard Colors**	9	5	['deblending', 'objec	This is nomin	A algorithm deve
16		pvi-recreation	**PVI Recreation**	9	5	[]	The steps inv	It is unclear whic
17		isr	**ISR**	9	6	[]	ISR exists and	We will fix as mu
18	DM-DRP-29	relative-astrometry-motion	**Stellar Motion in Relative Astron**	9	7	[]	Regardless o	Whether to proc

For DR1

...

43	DM-DRP-37	background-matching	**Background Matching in Coaddit**	2	3	[]	We had this i	We want to do
44		star-galaxy-classification	**Star/Galaxy Classification**	2	4	['galaxy-model-fittin	Star/galaxy c	Commissioning
45		forced-phot-blending	**Deblended Direct Forced Photon**	2	8	['deblending']	Forced photc	We plan to dev
46		wavefront-psfs	**Wavefront-Domain PSF Models**	2	9	['piff-psfs', 'drp-singl	We plan to r	We expect to at
47		background-reference	**Tract-sized Background Referenc**	0	3	['isr']	We once war	We can go on s
48	DM-DRP-31	photo-zs	**Photometric Redshifts**	0	4	['standard-colors']	Photometric	It is clear that t

Back to Milestones

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- Milestones we would change if possible:
  - **DM-DRP-13, DM-DRP-24 PSF Estimation:** Milestone is more than we need for DR1 and requires more on-sky data than we have.
  - **DM-DRP-31 Photo-z (due 6/2021)**
  - **Rename DM-DRP-25 "**Prototype multi-epoch fitting system available" to "Coaddition appropriate for Measurement available"

- Candidates for missing milestones, but unclear if we gain anything by adding milestones.
  - Shape Measurement for Shear Estimation
  - Inferred SEDs
  - Currently CBP pipeline not included.

- But prefer additional milestones were for **integration**, to track real inter-team interfaces/dependencies.
- We are concerned about the shrinking commissioning on-sky data and time.
  - We are going to discover e.g. ISR dragons while at the same time wrapping up the outstanding work packages