

DM organisation and reviews

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Data Management
LSST

5th March 2017, LSST JTM,
LA, California, USA.



1 Introducion

2 DM Organisation

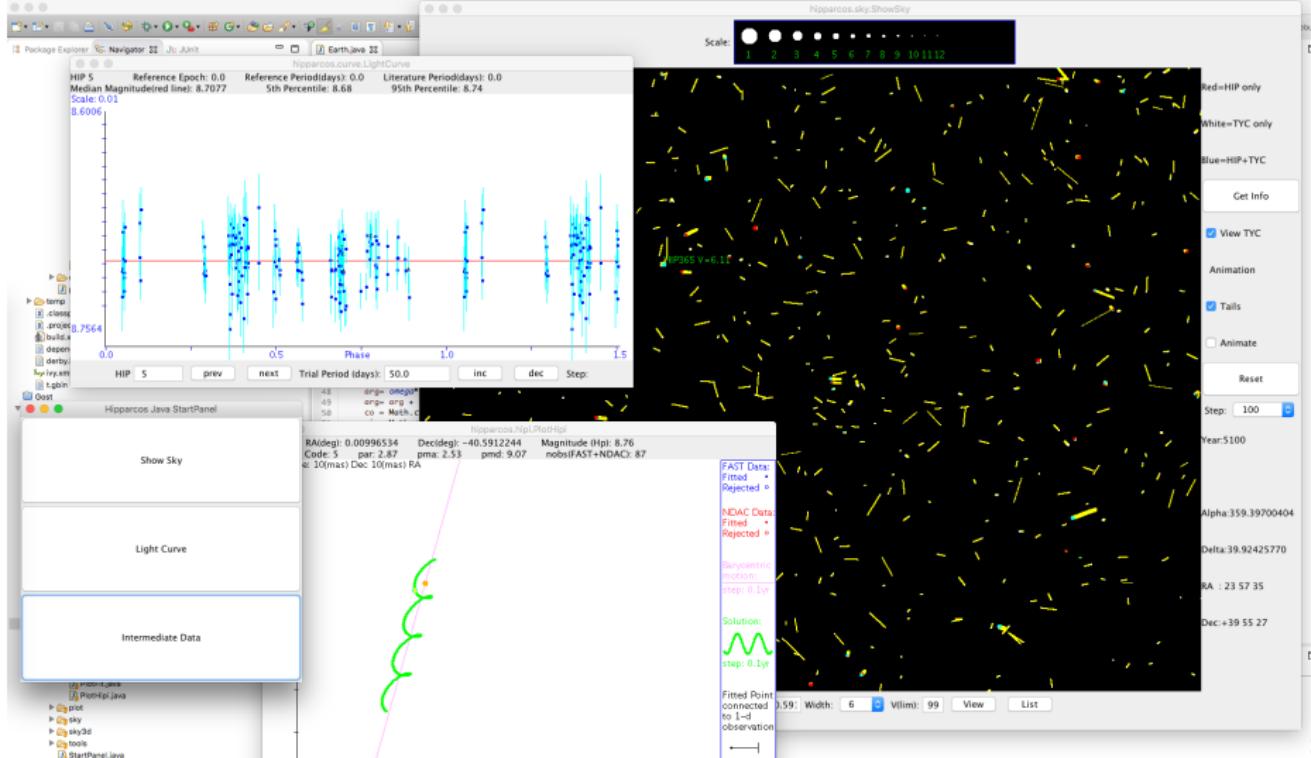
3 Milesones and Reviews



- 1985ish Life started with BASIC on a commodore
- 1993 graduated Computer Science Degree and Masters University College Cork, Ireland
- 1993 - 1997 Spacecraft Control Systems (C++) in ESA Mission Operations Centre Darmstadt Germany
- 1997 - 2001 Hipparcos, Integral, Planck, Gaia, Bepi-Sax (C,Java,Oracle, HTM, HEALPix) in ESA Technology Research Centre Noordwijk Netherlands
- 2001-2003 Commercial programming - some Astronomy (Java)
- 2003-2005 The Johns Hopkins, SDSS and National Virtual Observatory (C,C#,Java,Sqlserver)
- 2005-2014 Gaia Astrometric Solution and Science Operations (Java, Oracle, Intersystems Cache)
- 2012 PhD in Physics on Implementing the Gaia Astrometric Solution, Barcelona University
- 2014-2017 All ESA Science Ground Segments in Development

1997/98 Hipparcos Java Tools - learning Astrometry

<http://www.cosmos.esa.int/web/hipparcos/java-tools>





In the USA ..

Quality tools for GSC2 (Java) →

CasJobs (C#)(O'Mullane et al., 2005)

View Jobs - Mozilla Firefox

File Edit View Bookmarks Tools Help

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Admin SkyServer Logout thinkar

Refresh this page to get latest info

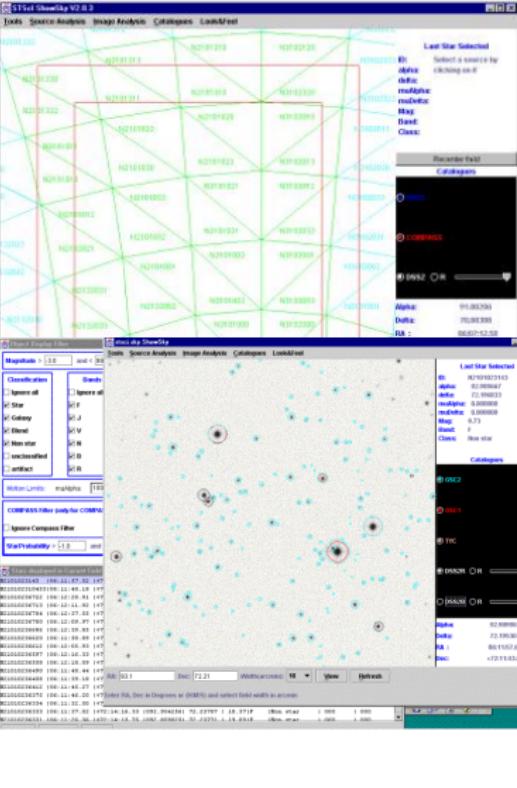
Status	Target	Name Like
ANY	DR6	

Apply

Name	Query	Target	Submitted	Time(since)	Rows	Status
Info Quasar Search in Imaging	SELECT TOP 1000 run, DR6/600	7/15/2007 7:56:02 PM	DR6/1	0:0:0	10	Ready
Info Quick Query	-- Galaxies meeting multiple s	7/15/2007 7:55:02 PM	DR6/1	0:0:0	10	Finished
Info Sample Query 1	SELECT top 1000 G.ObjID, G.u,	7/15/2007 7:54:13 PM	DR6/600	0:0:4	11308	Started
Info My Query	select objid,ra,dec,modellmag_g	7/15/2007 12:17:42 AM	DR6/600	0:0:4	11308	Finished
Info My Query	SELECT count(*) as total	7/8/2007 11:28:37 AM	DR6/600	0:1:1	1	Failed
Info My Query	SELECT TOP 1000 P.ObjID into m	7/8/2007 11:27:47 AM	DR6/600	0:7:53	1000	Finished
Info My Query	SELECT TOP 1000 run,	7/8/2007 11:27:22 AM	DR6/600	0:0:1	1	Failed
Info My Query	SELECT TOP 10000 run,	7/8/2007 11:27:06 AM	DR6/600	0:0:2	10000	Finished
Info My Query	select top 10 * into mydb.Myta	6/26/2007 4:30:35 PM	DR6/1500	0:0:0	10	Finished
Info My Query	select top 10 * from dr3quasar	6/26/2007 1:08:12 PM	DR6/1	0:0:0	10	Finished
Info My Query	select top 10 * from dr3quasar	6/26/2007 1:08:03 PM	DR6/1	0:0:0	10	Failed

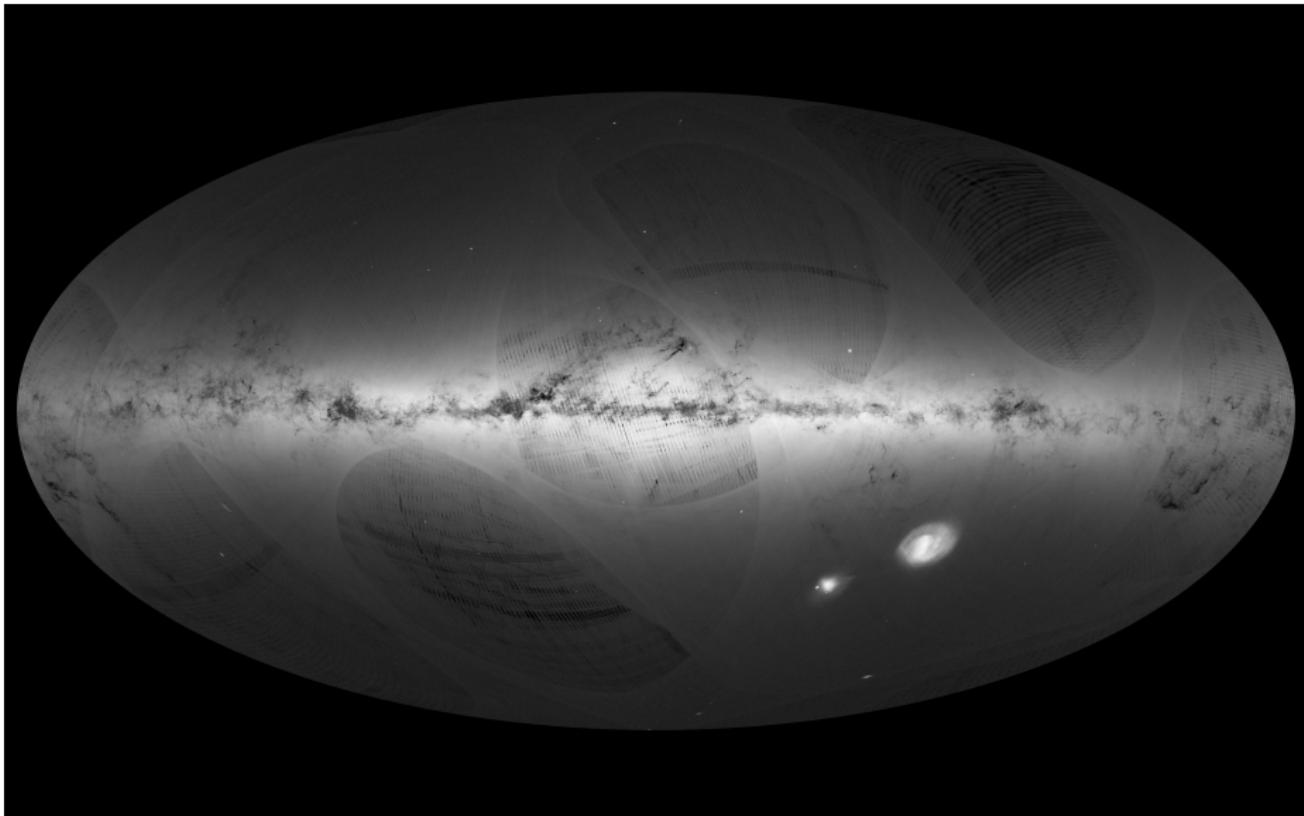
Contact

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- ESAC Located near Madrid, Spain.
- Home of the Science Operations Department containing Operations Development Division.
- Develop Science Operations Systems:
 - People, Procedures and Software.
 - Interactions MOC and scientific communities.
 - Quite a bit of software - diverse - mainly Java but FORTRAN, C, C++, Python ..
 - Prepare for planning, simulations, instrument performance, commanding.
 - Hand over system to operations division after commissioning.





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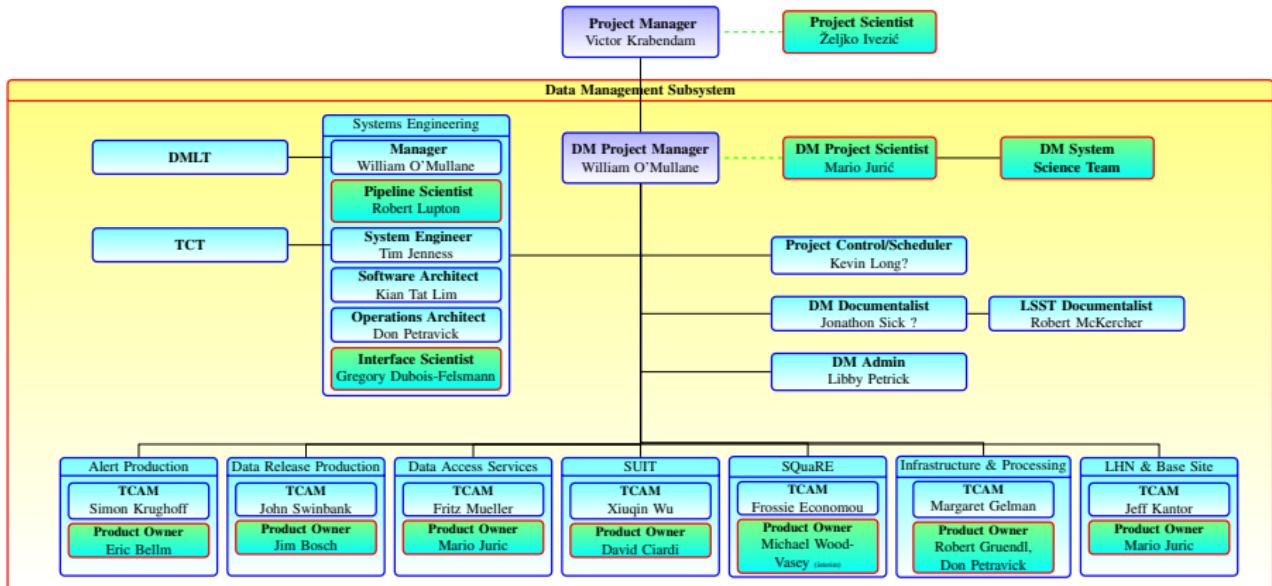
- Victor remains interim PM until April
- Have been trying to get an idea of DM organisation - talking to DMLT and TCAMS
- Following are some observations and draft ideas

Look out for a new version of LDM-294 - DM Management Plan

- It will detail roles and responsibilities in DM

DM Mission :

Stand up operable, maintainable, quality services to deliver high-quality LSST data products for science, all on time and within reasonable cost.





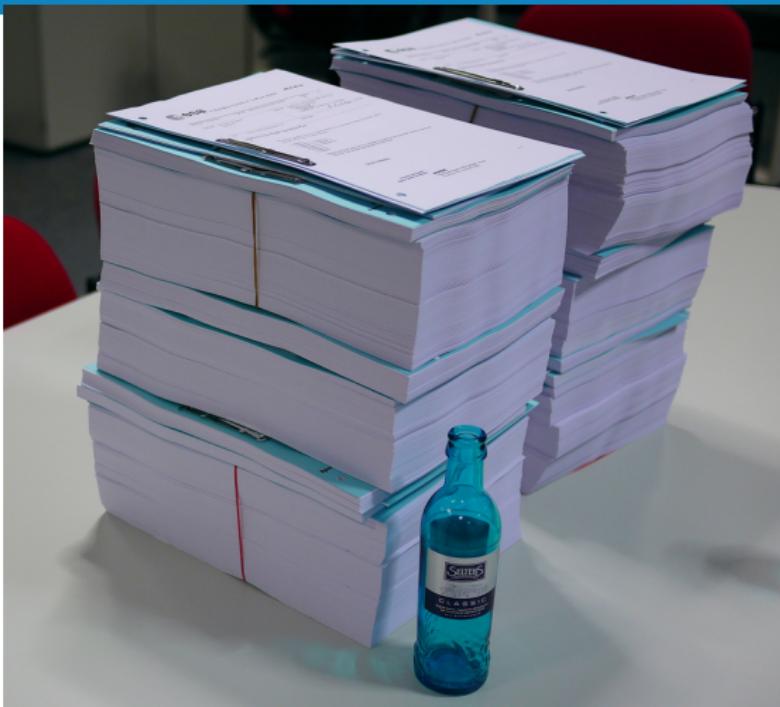
- Would like to get a list of products in DM
- Related to understanding the DM architecture - KT working on LDM-148 update more from him in a while
- Those are not Data Products - mostly Systems and Software artefacts
- For each product identify *Product Owner* and manager.
- This would change the org chart ..



Also in LDM-294:

- Would like an open Risk approach - anyone can raise a risk (Tim working on that)
- Configuration control (change management, configuration item lists for deployments)
- Product assurance and Scientific Validation
- Document management - in next slides
- ...

Mainly these will be high level and point to the details in other documents.

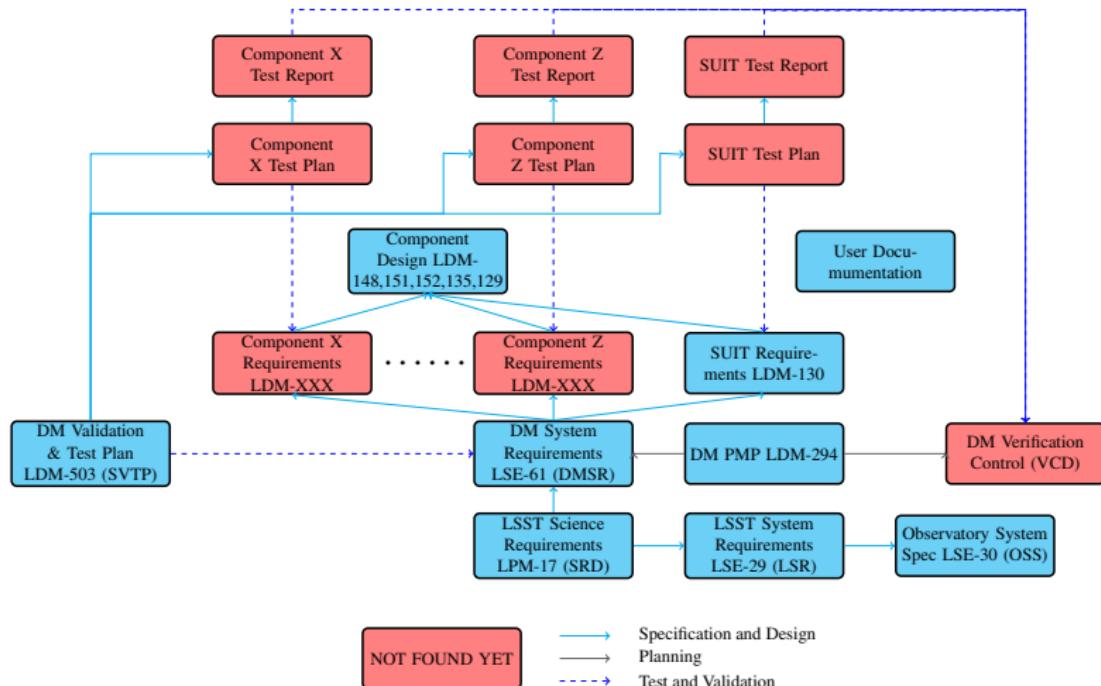


The FOP is followed by the spacecraft operators - the paper copy is just in case the computers fail - could be useful!

But we should avoid *write only* documents.



- We will be working on a Documentation Tree for DM
- Some documents exist - some have not yet been found
- Wish to figure out what is missing
- LDM-294 will have a section on documentation
- Adhere to LSST Document Plan LPM-051?
- Would like a bibtex file of all Docushare issued documents
- **All products should be listed and for each product the set of docs expected and the dates**
 - each document type is targeted at a different audience (e.g. Requirement, Design/Implementation, Installation, User ...)
 - not all products have all document types.





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The re plan

Lots of work has gone in to the new DM plan

REPLAN 17-03.02C.00 DM Level 2 Milestones		01-Jun-2016	01-Jun-2022	1524
F16	F16 Start	01-Jun-2016*		0
S17	S17 Start	01-Dec-2011		0
DM-ReplanMS-0000-0160	calibration products design document	01-Jun-2017		SQ-MGT, SQ-QC-E
DM-ReplanMS-0000-0490	Prototype DAC-SOSS	01-Jun-2017		0 F17
DM-ReplanMS-0000-0500	Prototype DAC-WISE	01-Jun-2017		0 F17
DM-ReplanMS-0000-0510	Universe model update	01-Jun-2017		0 F17
DM-ReplanMS-0000-1150	Pipeline QA functions definition	01-Jun-2017		0 F17
F17	F17 Start	01-Jun-2017*		0
DM-ReplanMS-0000-0350	Prototype L1 for Aux Tel	01-Dec-2017		S18
DM-ReplanMS-0000-0360	Prototype L1 through Diffim	01-Dec-2017		S18
DM-ReplanMS-0000-0800	Dispatch QA pipelines from SUIT/Firefly interface	01-Dec-2017		S18
DM-ReplanMS-0000-0950	Private user storage space setup/process	01-Dec-2017		S18
S18	S18 Start	01-Dec-2011		0
DM-ReplanMS-0000-0040	Buffer access to bi-temporal calibration products database	01-Jun-2018		SQ-DS-J-1, SQ-D5
DM-ReplanMS-0000-0370	Production L1 for Aux Tel	01-Jun-2018		0 F18 AP-030
DM-ReplanMS-0000-0380	Prototype L1 through AlertGen	01-Jun-2018		0 F18
F18	F18 Start	01-Jun-2018*		0
DM-ReplanMS-0000-0120	Orbit database schema	03-Dec-2018		SQ-QC-V-1, SQ-DE
DM-ReplanMS-0000-0390	Prototype L1 through Alert Broker	03-Dec-2018		0 S19
DM-ReplanMS-0000-0430	Prototype L2 through Coadd	03-Dec-2018		0 S19
DM-ReplanMS-0000-0480	Prototype QA/Commissioning Environment	03-Dec-2018		0 S19
DM-ReplanMS-0000-1050	API to get image at a given resolution and size	03-Dec-2018		0 S19
S19	S19 Start	03-Dec-2011		0
DM-ReplanMS-0000-0030	Alert database schema	03-Jun-2019		SQ-QC-A-1, SQ-D1
DM-ReplanMS-0000-0100	L1 database schema	03-Jun-2019		0 F19
DM-ReplanMS-0000-0810	Full specification of postprocessing requirements	03-Jun-2019		0 F19
DM-ReplanMS-0000-1040	LSST all-sky image (mock version)	03-Jun-2019		0 F19
F19	F19 Start	03-Jun-2019*		0
DM-ReplanMS-0000-0400	Production L1 for ComCam	02-Dec-2019		SQ-QC-S-3, SQ-D1
DM-ReplanMS-0000-0440	Production L2 for ComCam	02-Dec-2019		0 S20
DM-ReplanMS-0000-0460	Prototype L2 through MultiF	02-Dec-2019		0 S20
DM-ReplanMS-0000-0750	Detailed requirements for postprocessing pipelines	02-Dec-2019		0 S20
S20	S20 Start	02-Dec-2011		0
DM-ReplanMS-0000-0420	Production L1 for Camera	01-Jun-2020		SQ-QC-S-4, SQ-Q1
DM-ReplanMS-0000-0470	Production L2 for Camera	01-Jun-2020		0 F20
F20	F20 Start	01-Jun-2020*		0
DM-ReplanMS-0000-0410	Production L1 for Science Verification	01-Dec-2020		SQ-DS-P-1, DRP-C
DM-ReplanMS-0000-0460	Production L2 for Science Verification	01-Dec-2020		0 S21
S21	S21 Start	01-Dec-2020		0
F21	F21 Start	01-Jun-2021*		0
S22	S22 Start	01-Dec-2022		0
F22	F22 Start	01-Jun-2022*		0

↑ S17 Start

- ◆ calibration products design document
- ◆ Prototype DAC-SOSS
- ◆ Prototype DAC-WISE
- ◆ Universe model update
- ◆ Pipeline QA functions definition

↑ F17 Start

- ◆ Prototype L1 for Aux Tel
- ◆ Prototype L1 through Diffim
- ◆ Dispatch QA pipelines from SUIT/Firefly interface
- ◆ Private user storage space setup/process

↑ S18 Start

- ◆ Buffer access to bi-temporal calibration products database
- ◆ Production L1 for Aux Tel
- ◆ Prototype L1 through AlertGen

↑ F18 Start

- ◆ Orbit database schema
- ◆ Prototype L1 through Alert Broker
- ◆ Prototype L2 through Coadd
- ◆ Prototype QA/Commissioning Environment
- ◆ API to get image at a given resolution px

↑ S19 Start

- ◆ Alert database schema
- ◆ L1 database schema
- ◆ Full specification
- ◆ LSST all-sky image

↑ F19 Start



- June 2017 - Prototype Data Access Centre - with WISE Data+
- Dec 2017 - Private databases/User tables .. Notebooks
- 2018 - Prototypes for various processes and databases - Minimum Viable System
 - 2018 - Mountain base network up
 - 2018 - Prototype alerts through broker
- Dec 2019 - Com Cam L1,L2 Production
- Jun 2020 - Camera L1,L2 Production
- ...

*Test plans which show milestones have been met are needed.
Longer term working with Mario on which data products will come out
when ..*



- Reviews are inevitable and necessary in large project
- Next DM Review **July 25-27**
- Review should confirm we are on the correct track and may indicate areas of improvement
- Docs updated in each cycle concentration before review on docs for that review. **May be a bit more work this time**
- Latest released version of documents could be pulled from docushare and handed over - *no particular extra work iff the work is done properly anyway*
- Of course some presentations will be needed also ..



- Looking forward to working with a great set of people in DM and LSST
- LSST has potential for huge impact in Astronomy
- I will use my experience and training to help get DM delivered
- I also have a lot to learn from LSST people so I hope you will all help me - intend to visit all the DM sites soon
- I have an open door policy
- Looking forward to the first LSST images !

Questions ??



The following table has been generated from the on-line Gaia acronym list:

Acronym	Description
DM	Data Model
DMLT	DM Leadership Team
ESA	European Space Agency
ESAC	European Space Astronomy Centre
FOP	Flight Operations Procedure
HIP	Hipparcos
HTM	Hierarchical Triangular Mesh
LSST	Large Synoptic Survey Telescope
MOC	Mission operations Centre
PM	Project Manager
SDSS	Sloan Digitized Sky Survey
TCAMS	Technical Control Account Manager

References



O'Mullane, W., Li, N., Nieto-Santisteban, M., et al., 2005, In: International Conference on Web Services,
Also MS technote <http://arxiv.org/pdf/cs.DC/0502072>