Python in “Big” Astronomy

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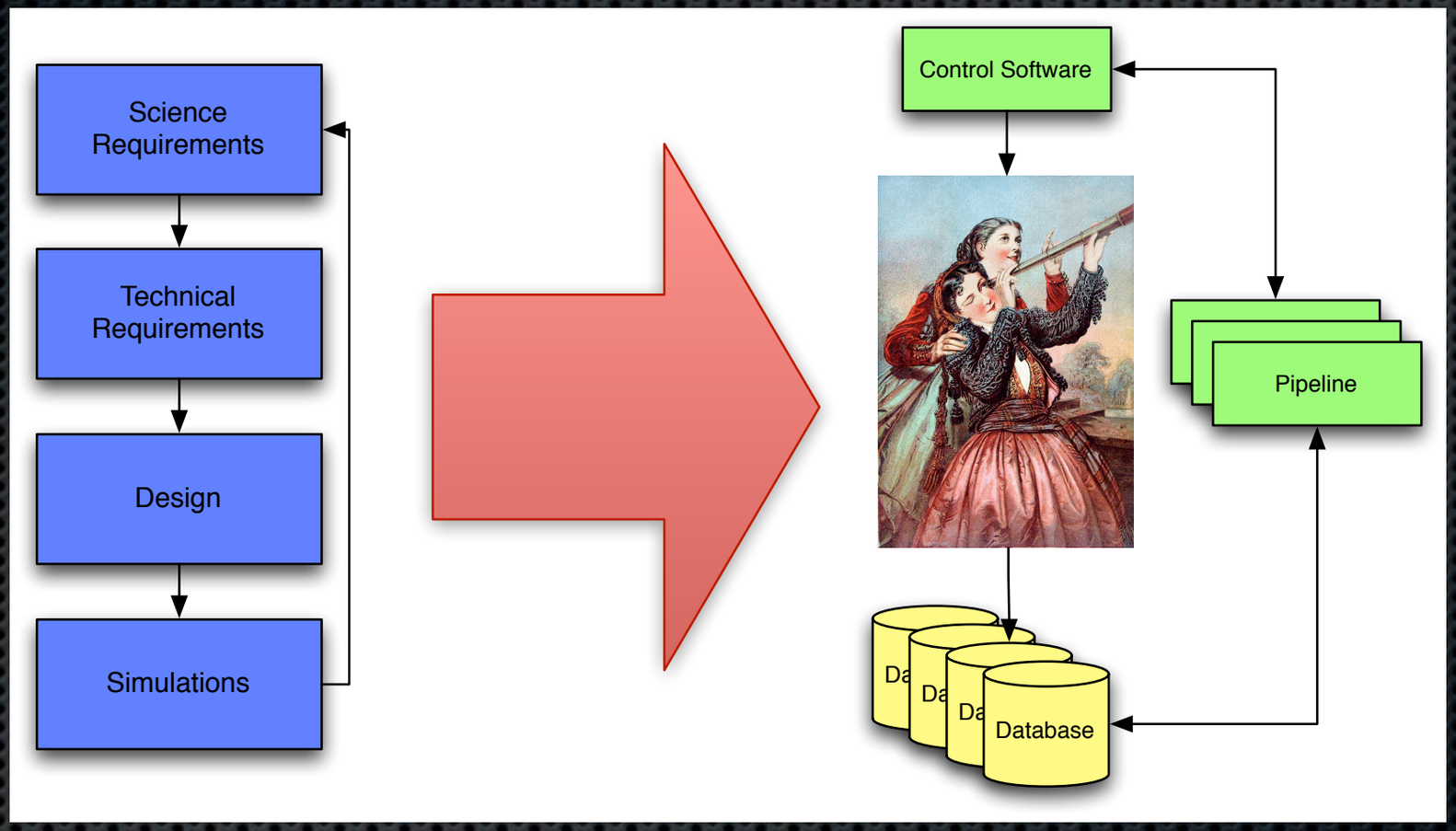
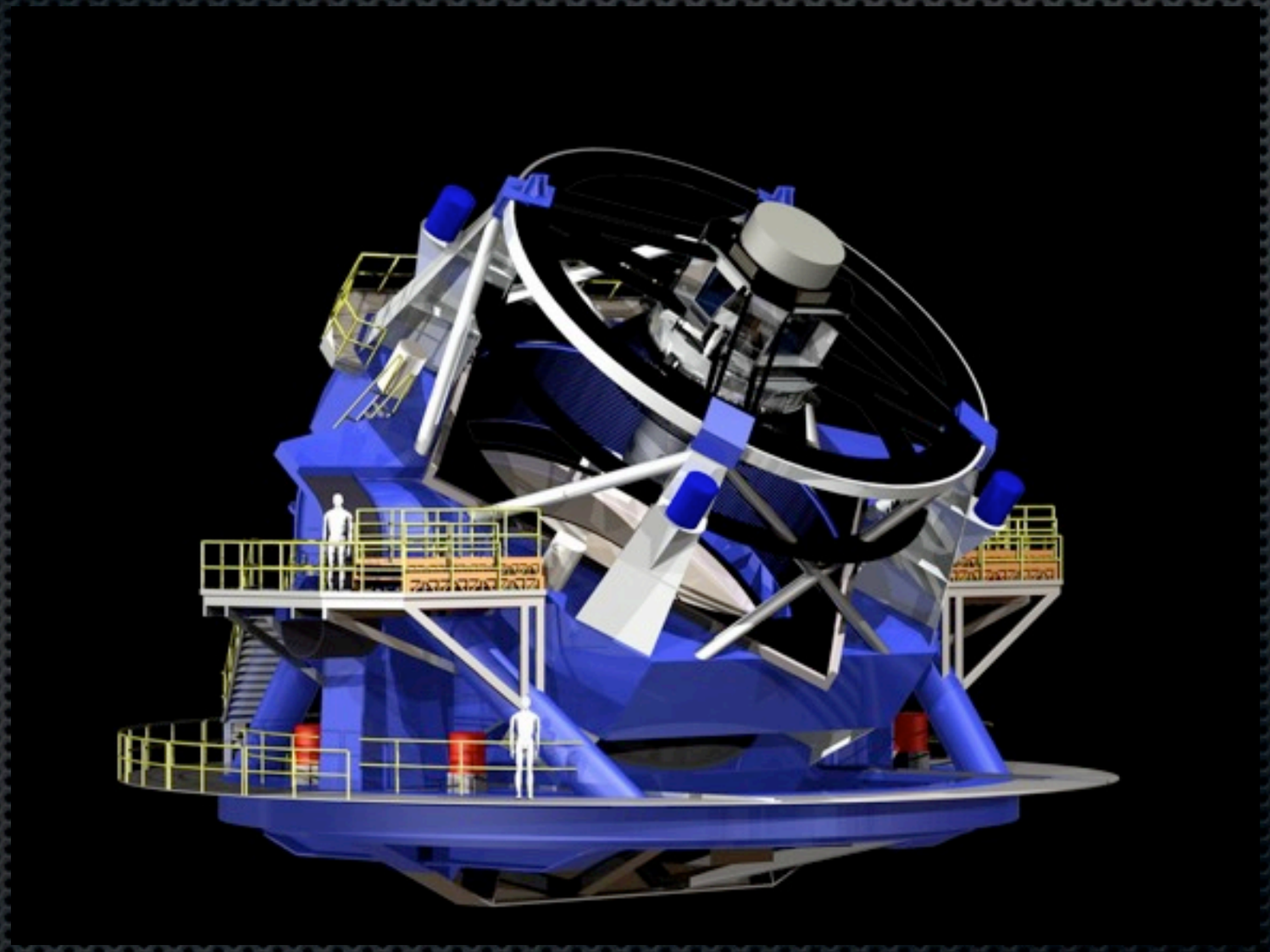
What is that we do?

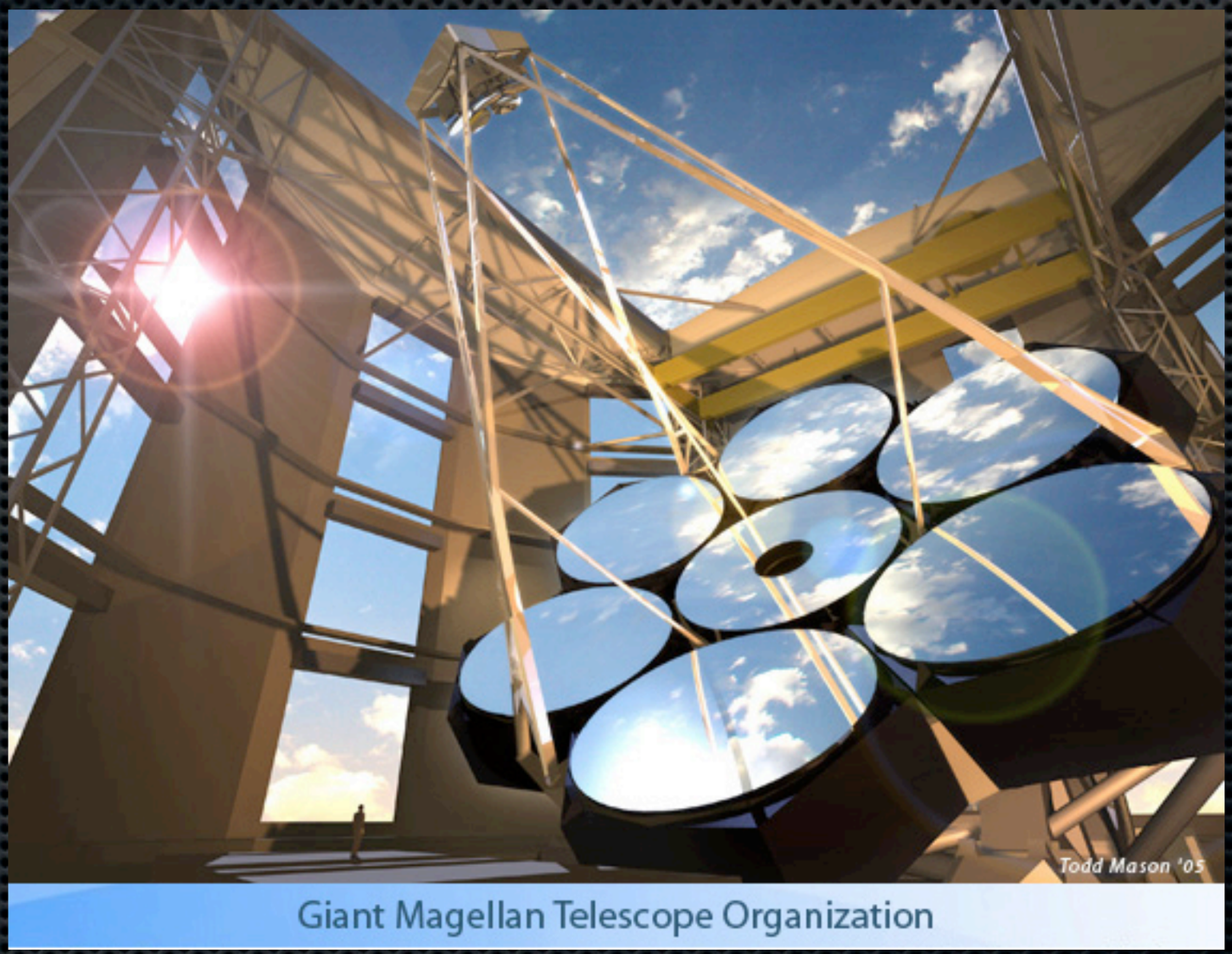


What this *is* about



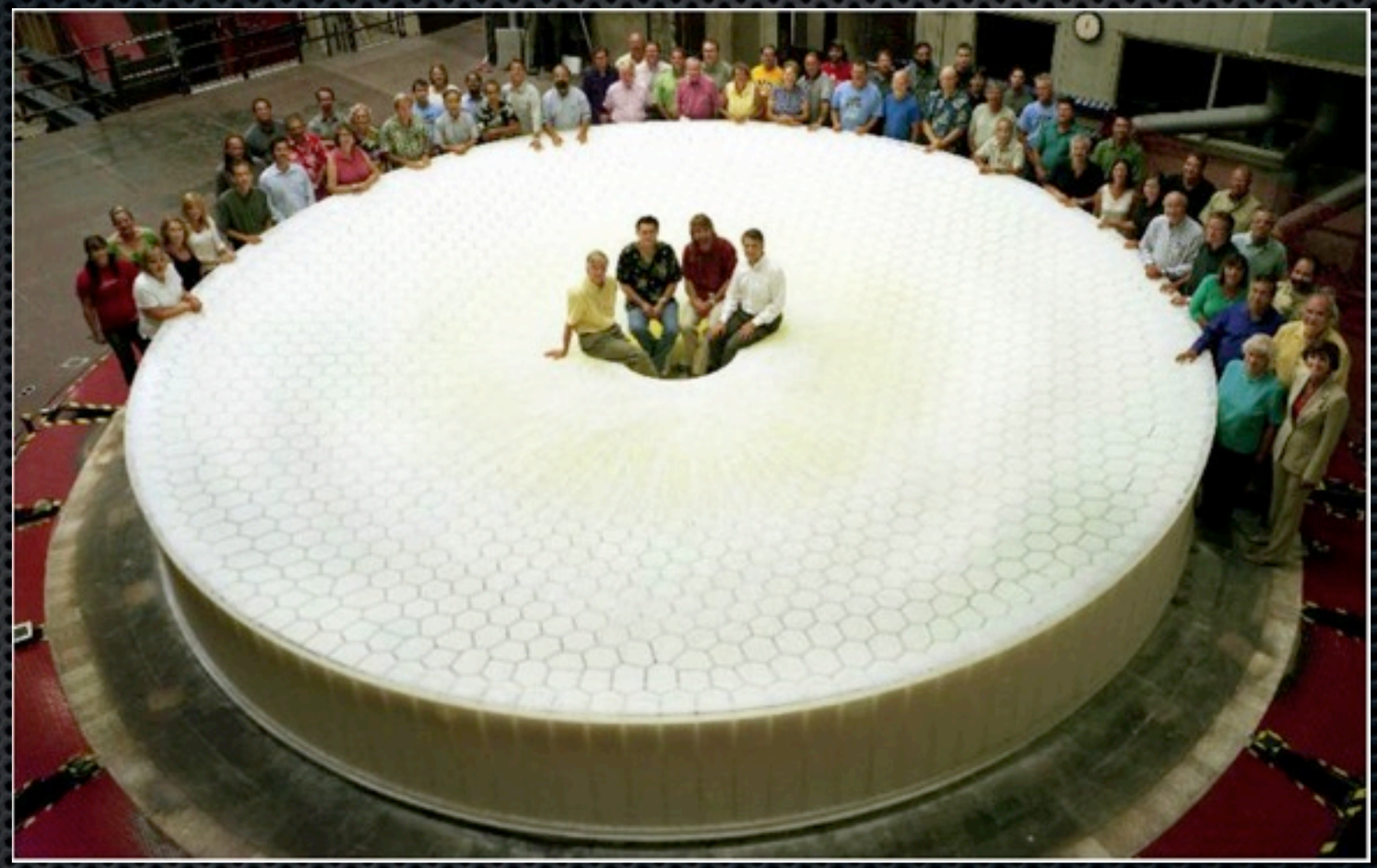
LSST

What this *is* about



GMT

What this *is* about



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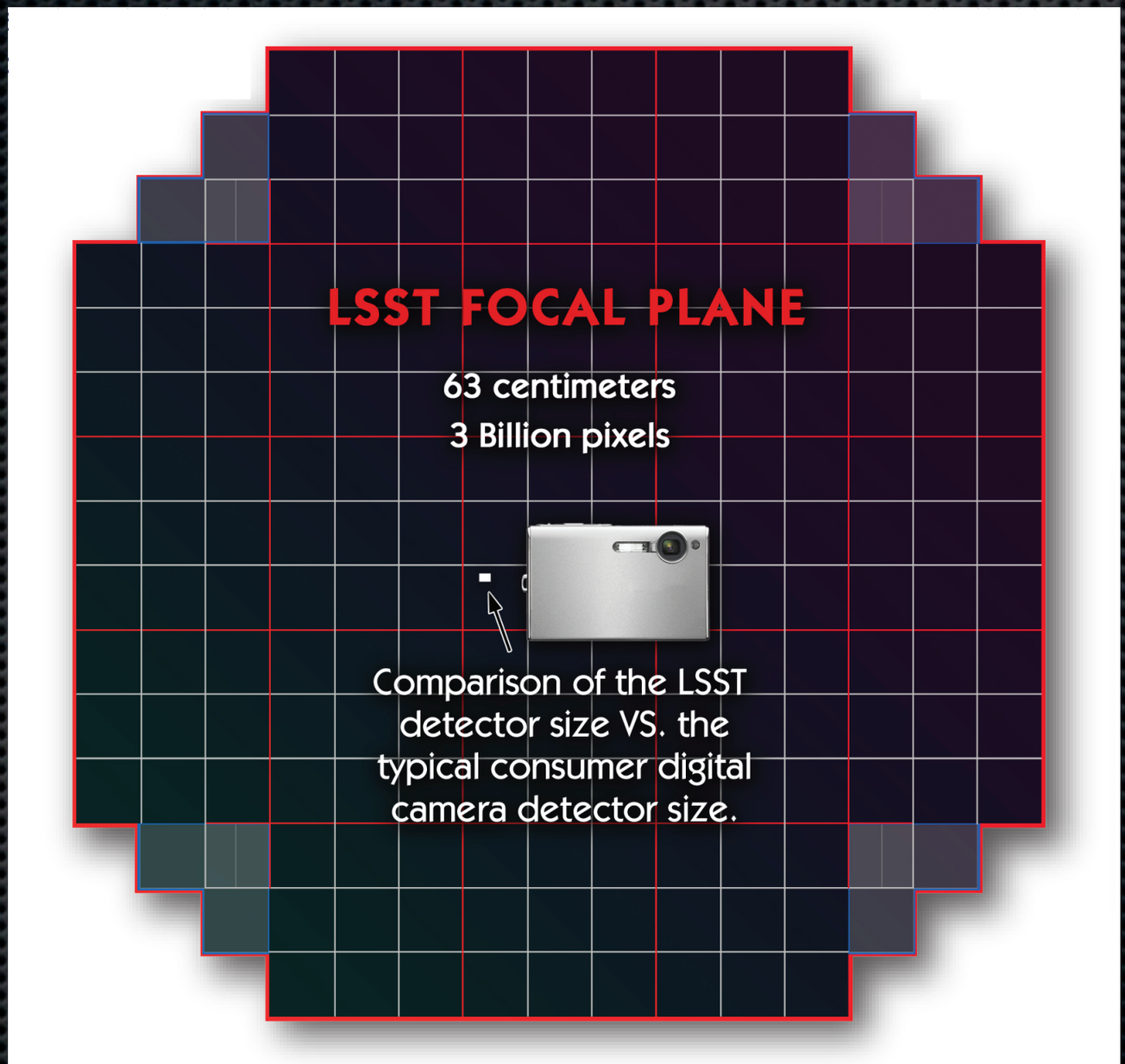
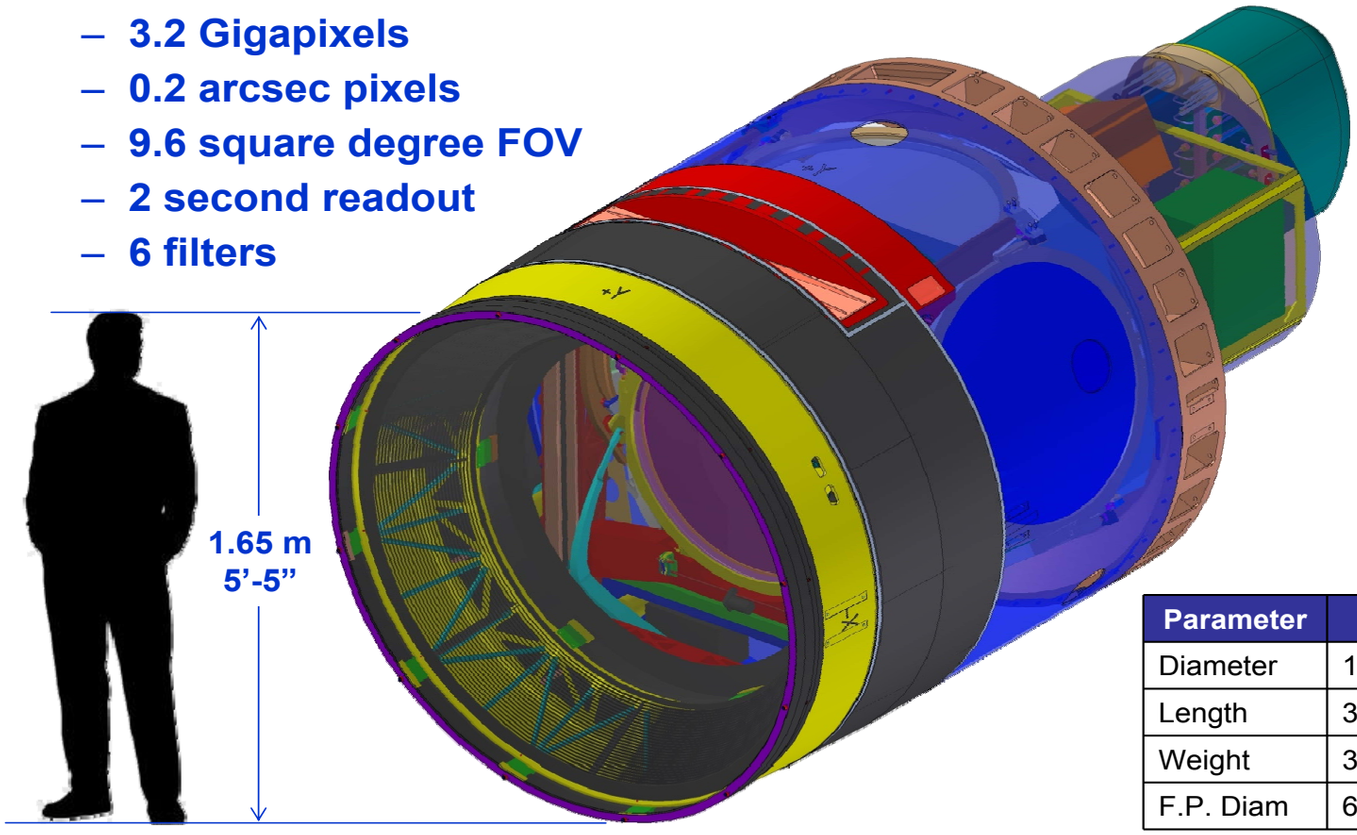


What this *is* about

Camera is meeting the technical challenges as the largest digital camera for astronomy

LSST Large Synoptic Survey Telescope

- **3.2 Gigapixels**
- **0.2 arcsec pixels**
- **9.6 square degree FOV**
- **2 second readout**
- **6 filters**



Parameter	Value
Diameter	1.65 m
Length	3.7 m
Weight	3000 kg
F.P. Diam	634 mm

What this *is* about

- Tens of terabytes/night
- Hundreds of petabytes final image archive
- Tens of petabytes final catalog
- ~100K events/night for 10 years
- Alert latency ≤ 60s

LSST

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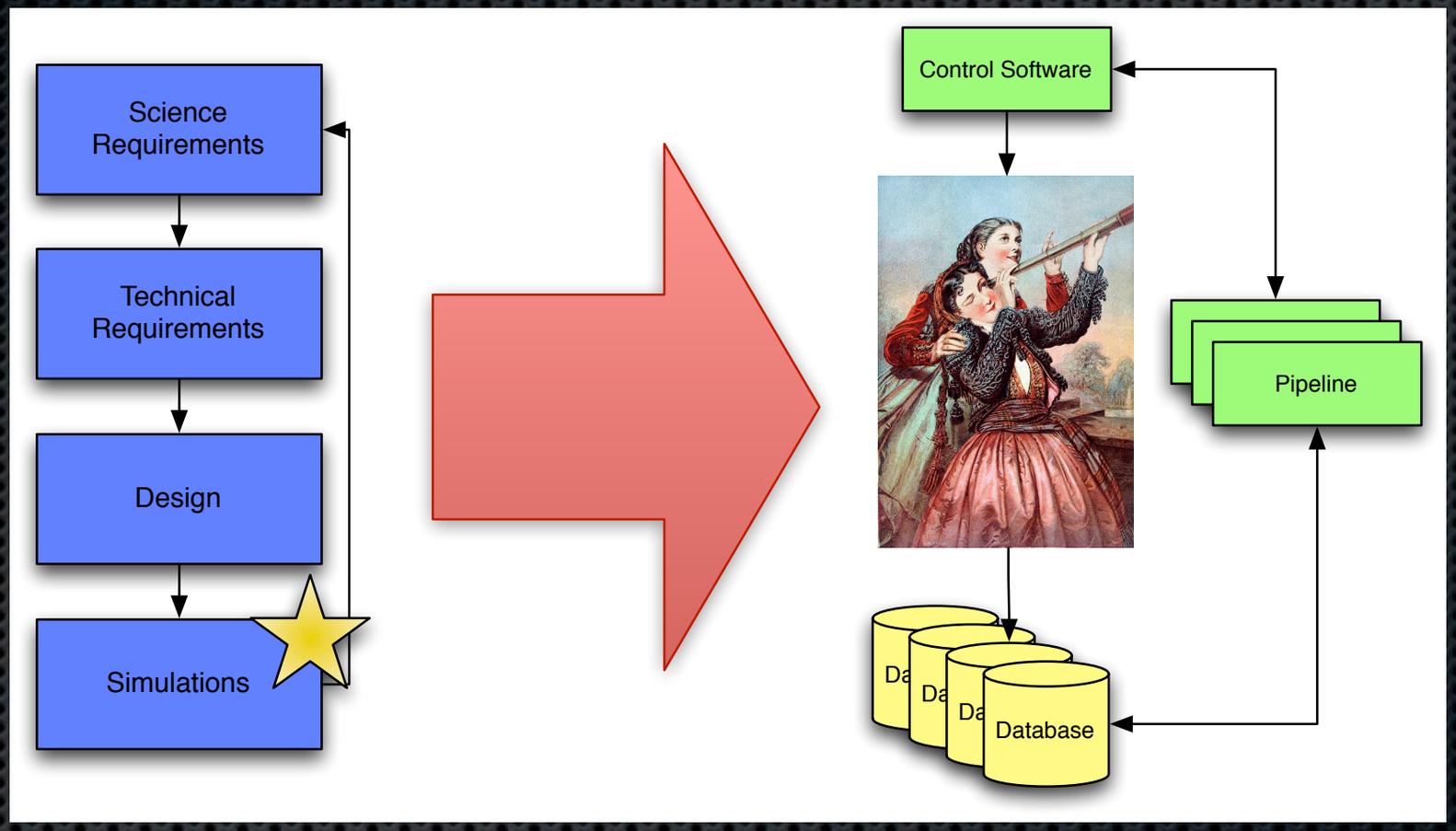
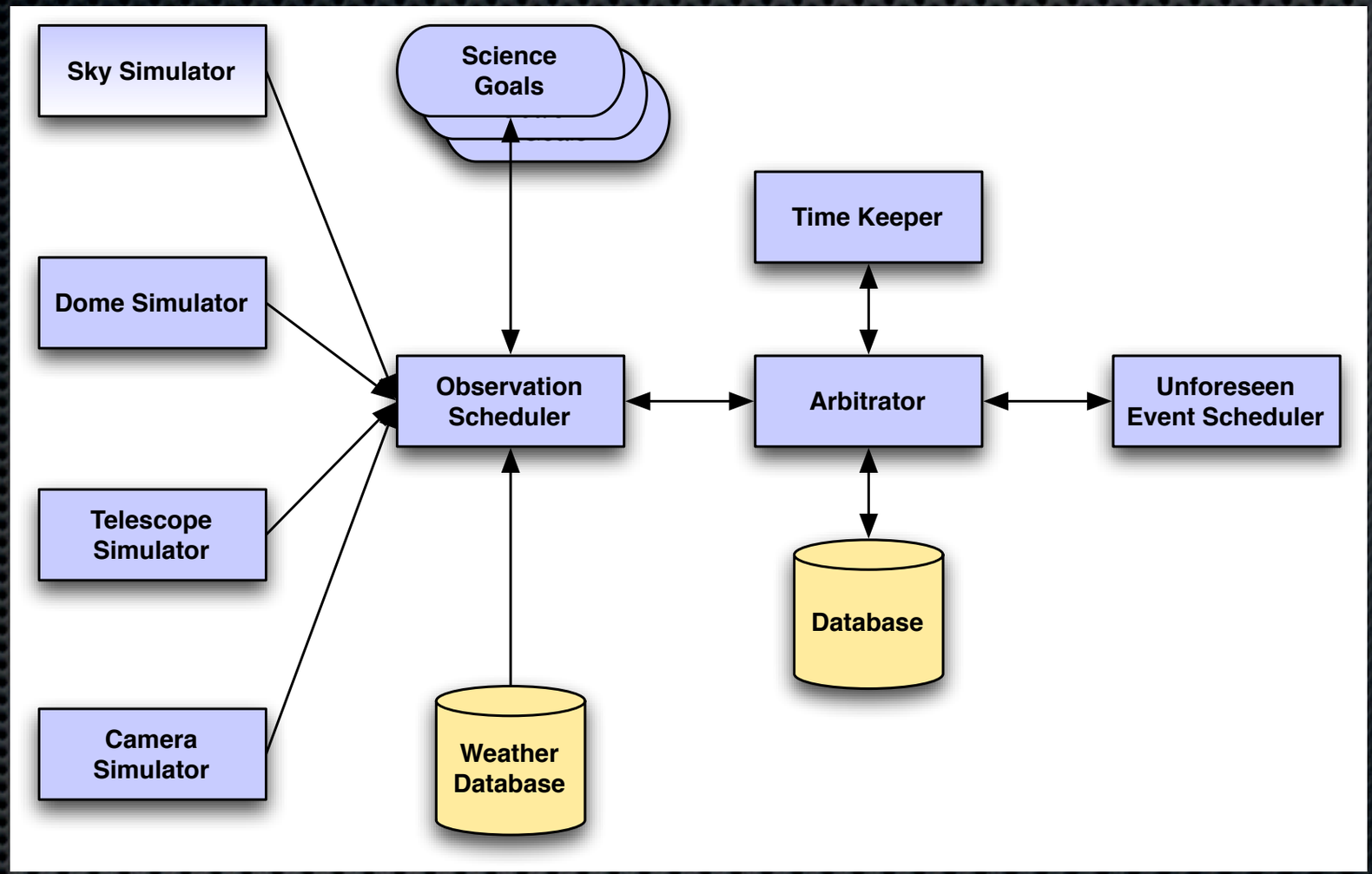


Simulations



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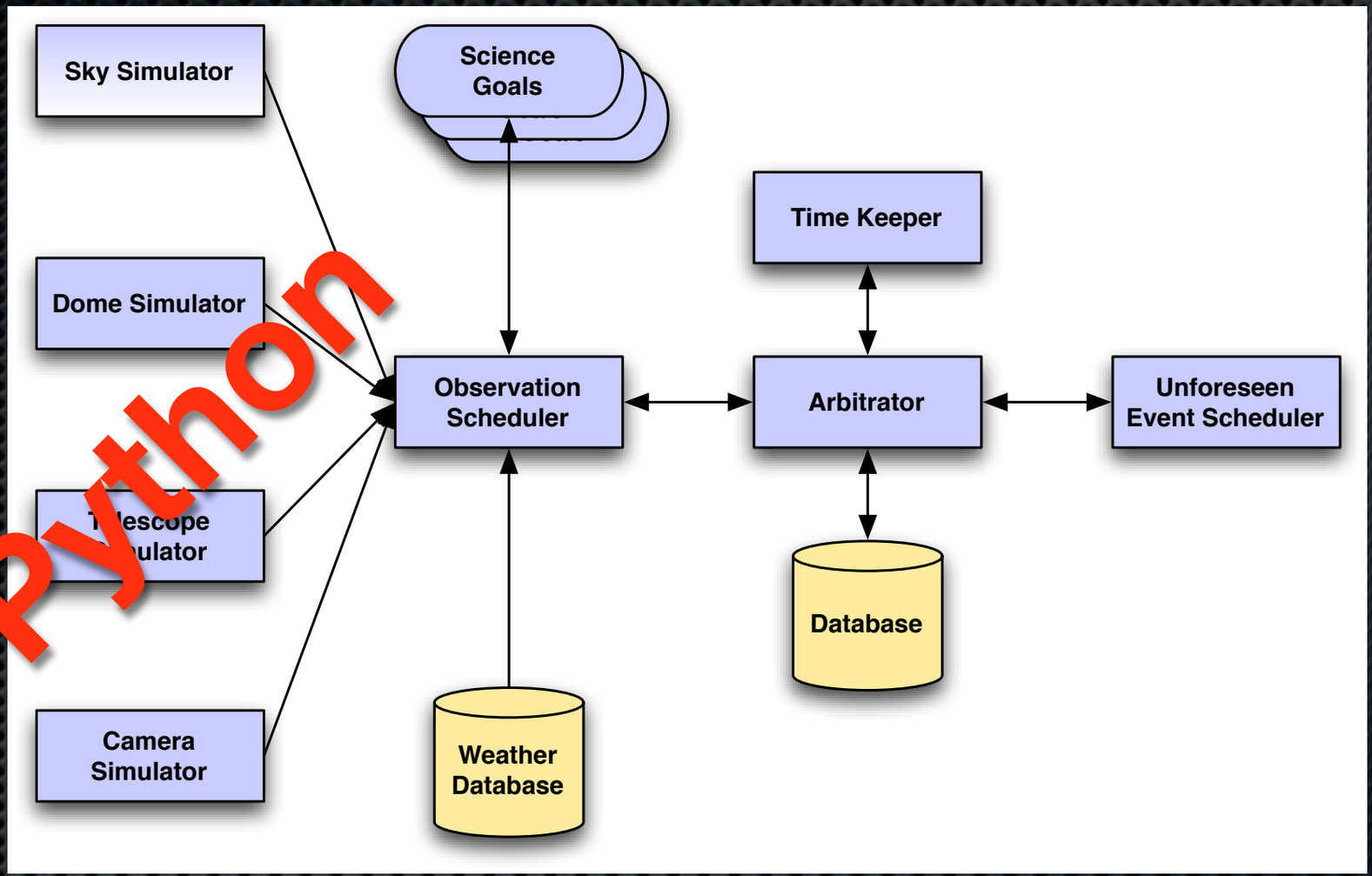

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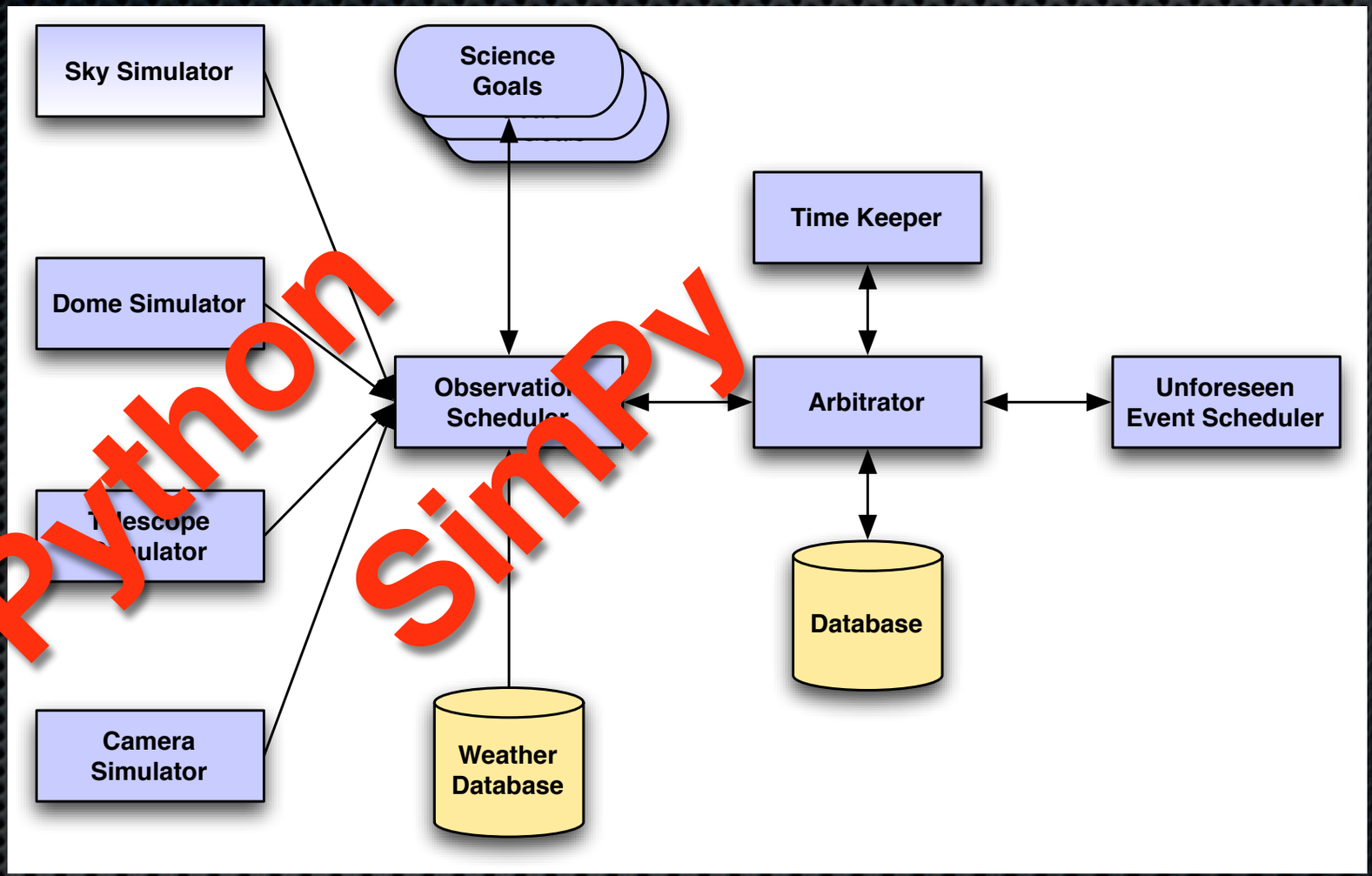

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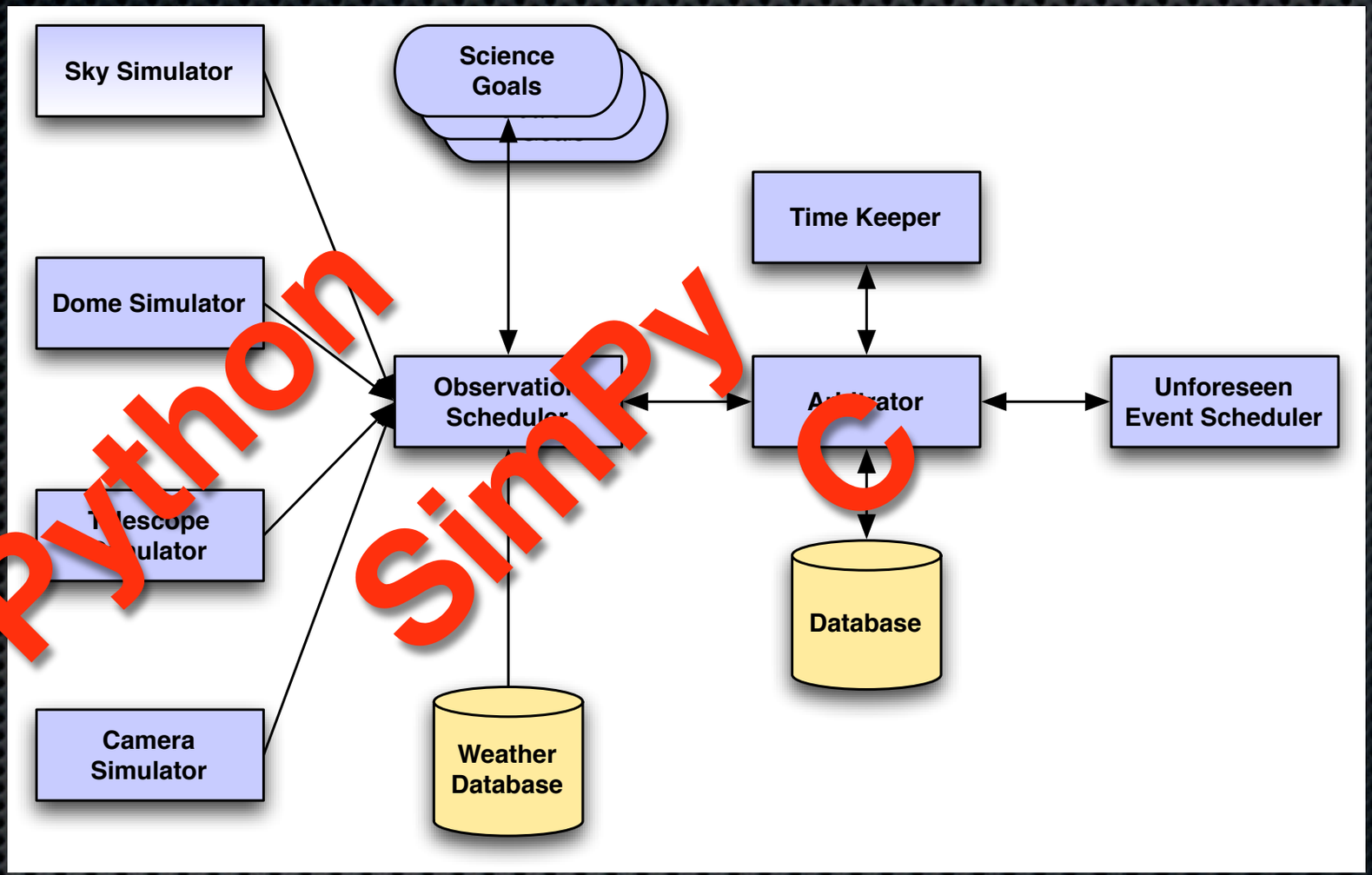

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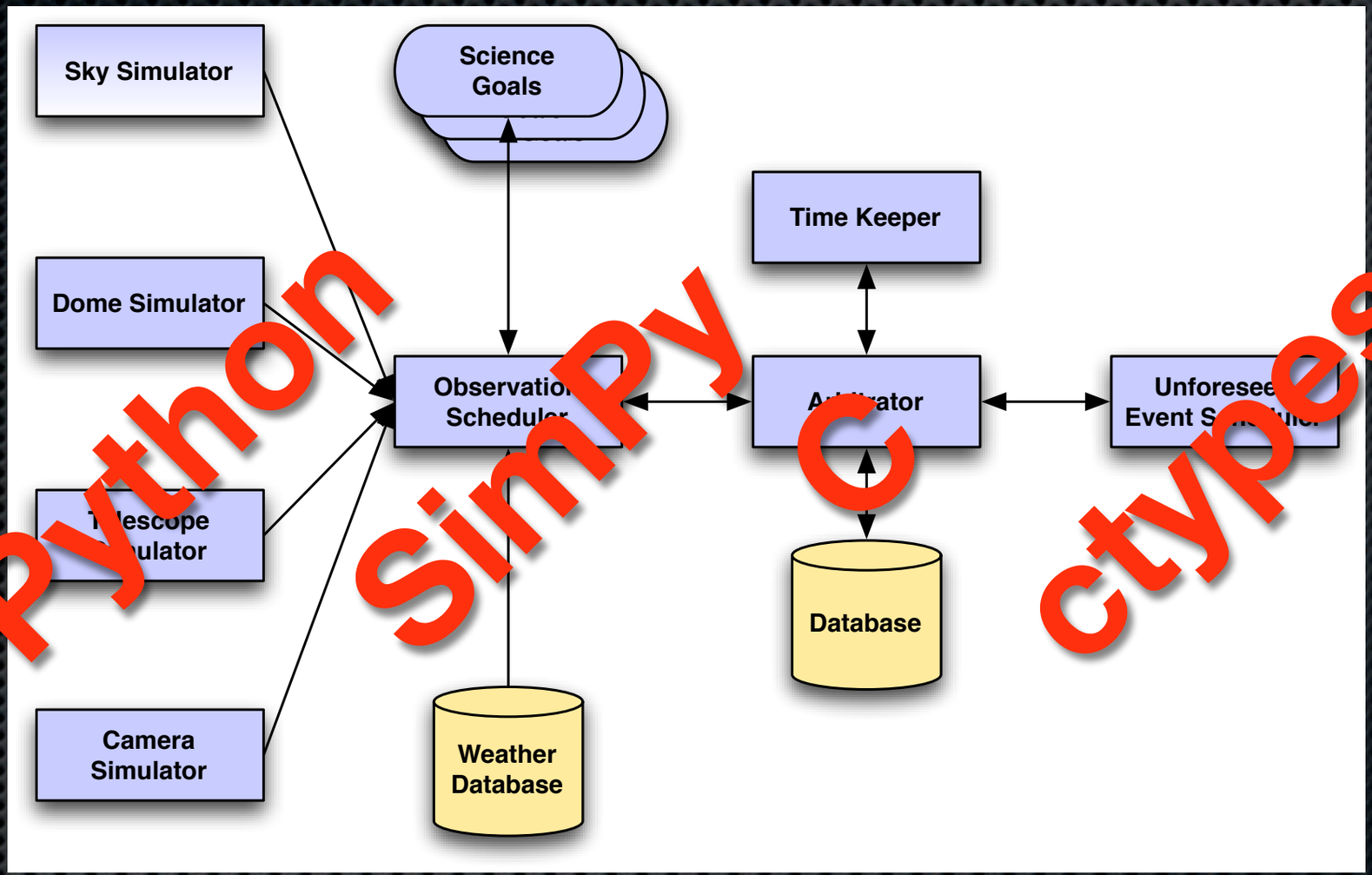

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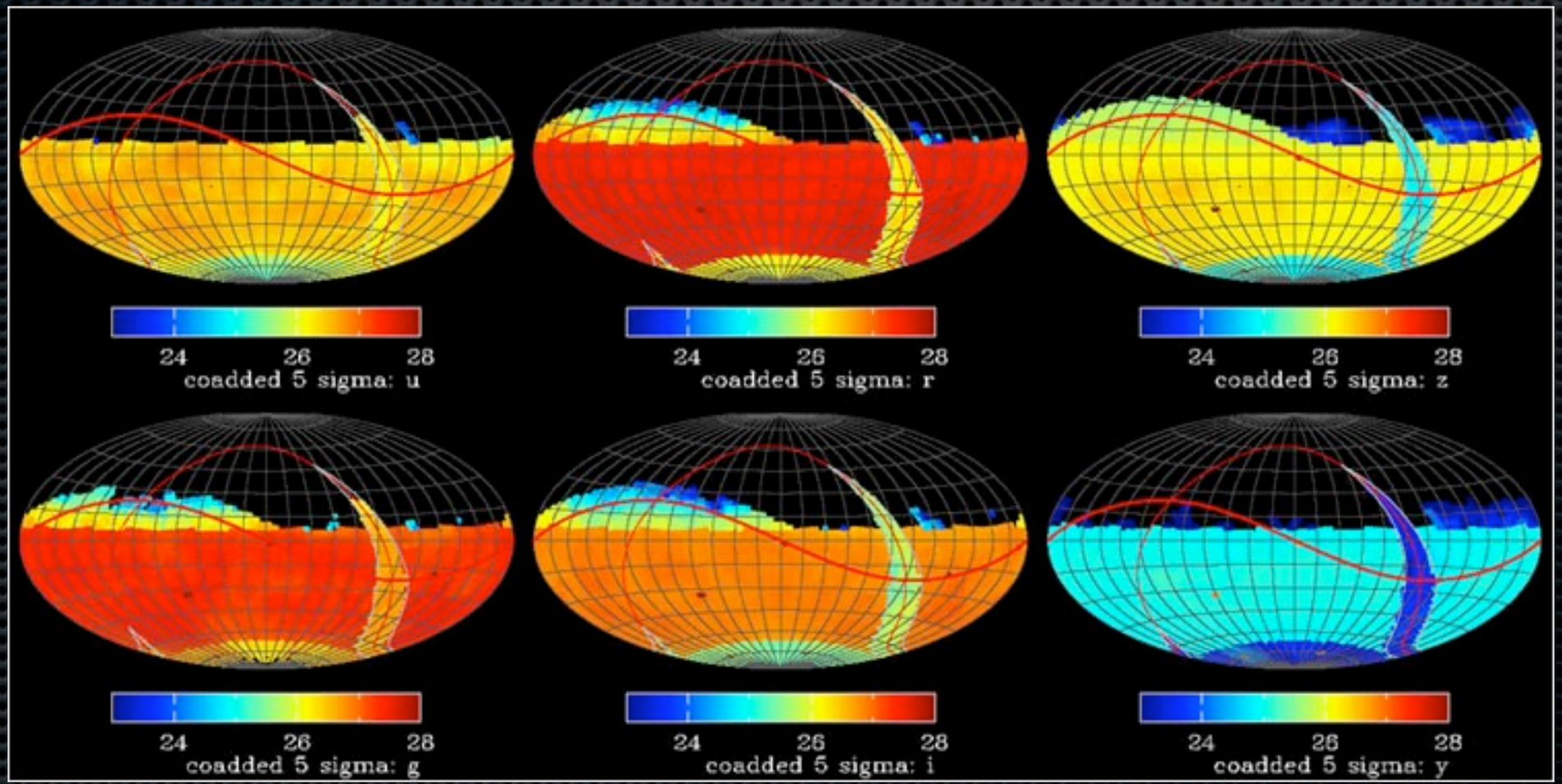

LSST

Example: ctypes

- ctypes_example.py
- ctypes_example.f90

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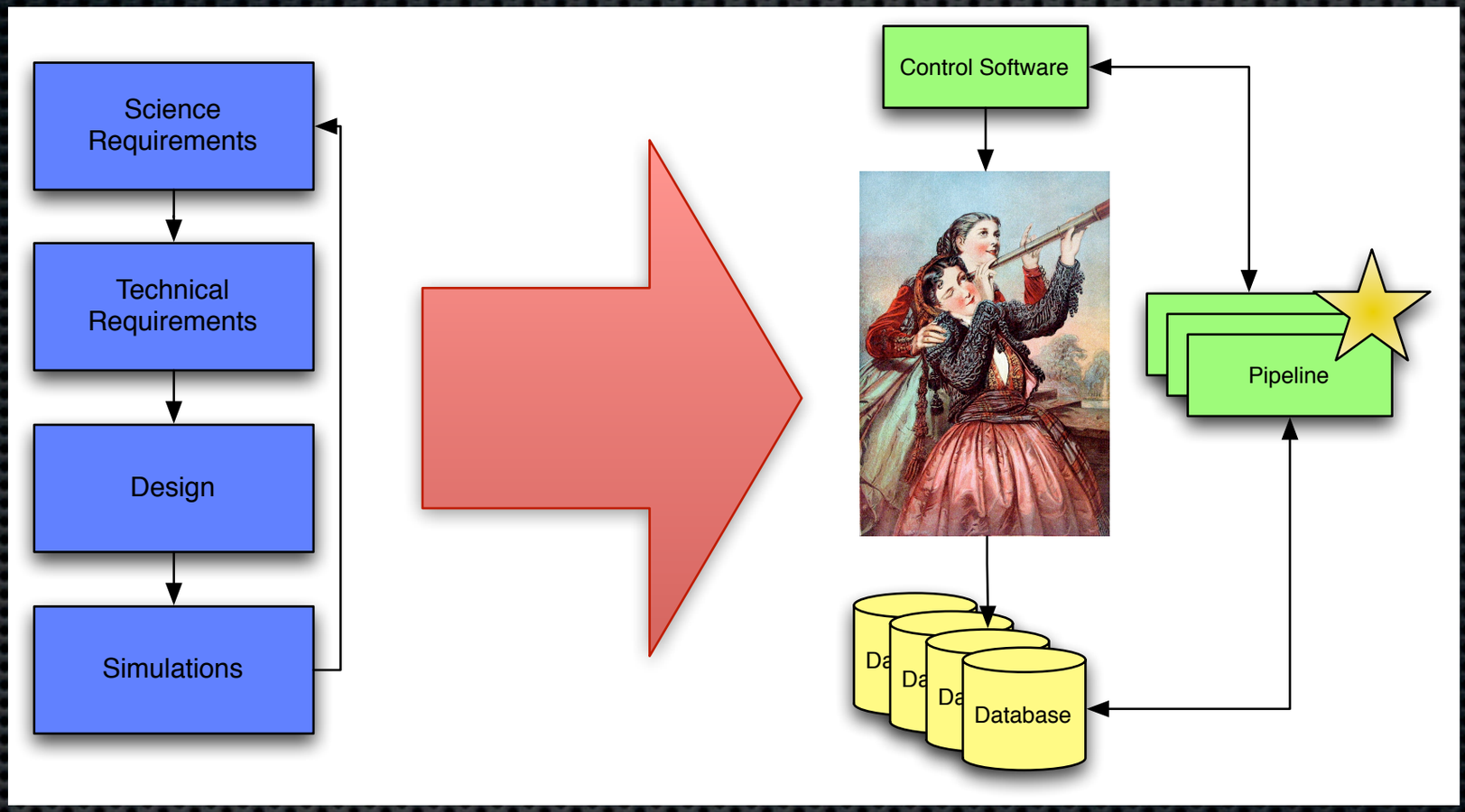
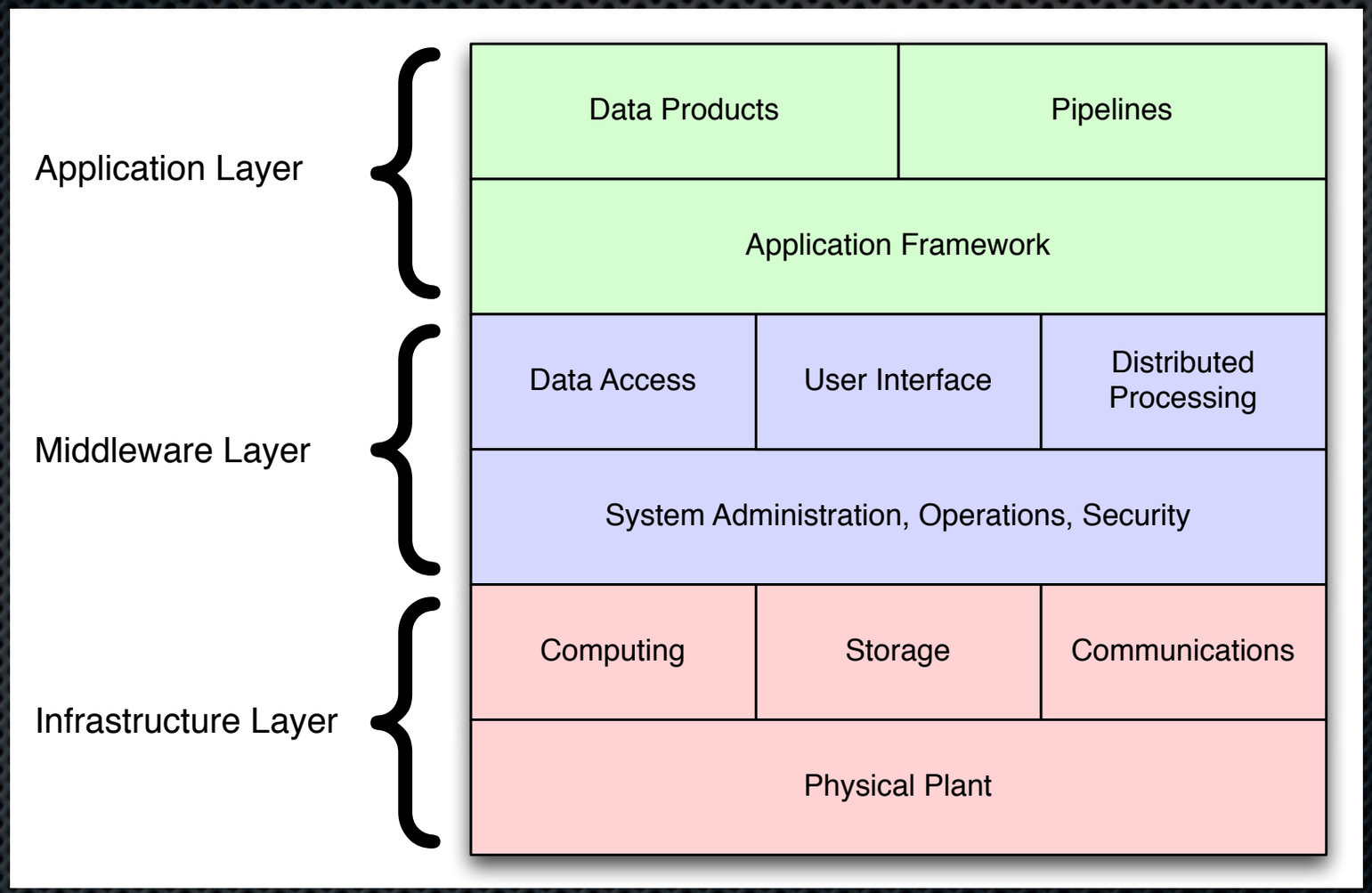


Data Management System



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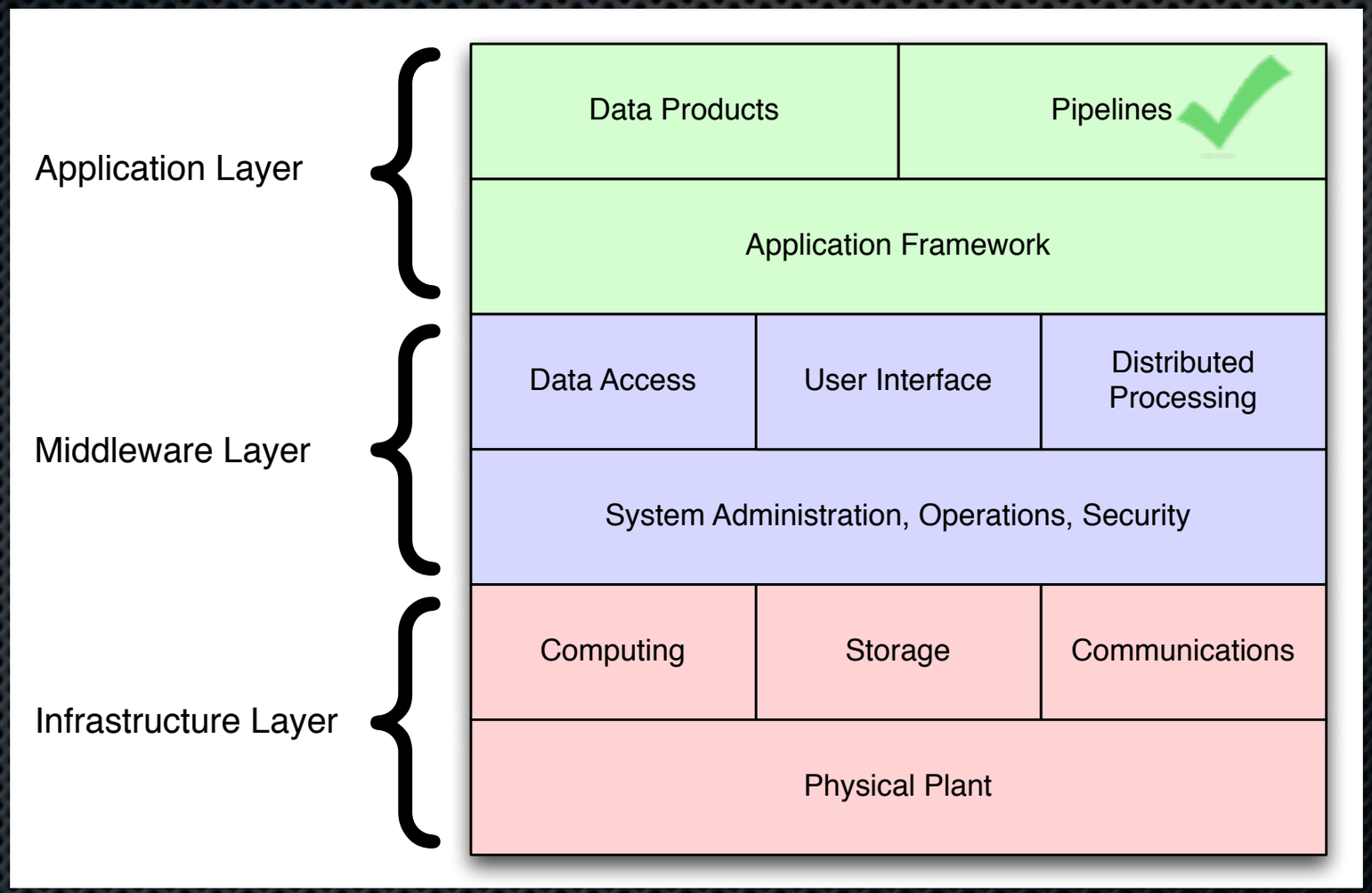

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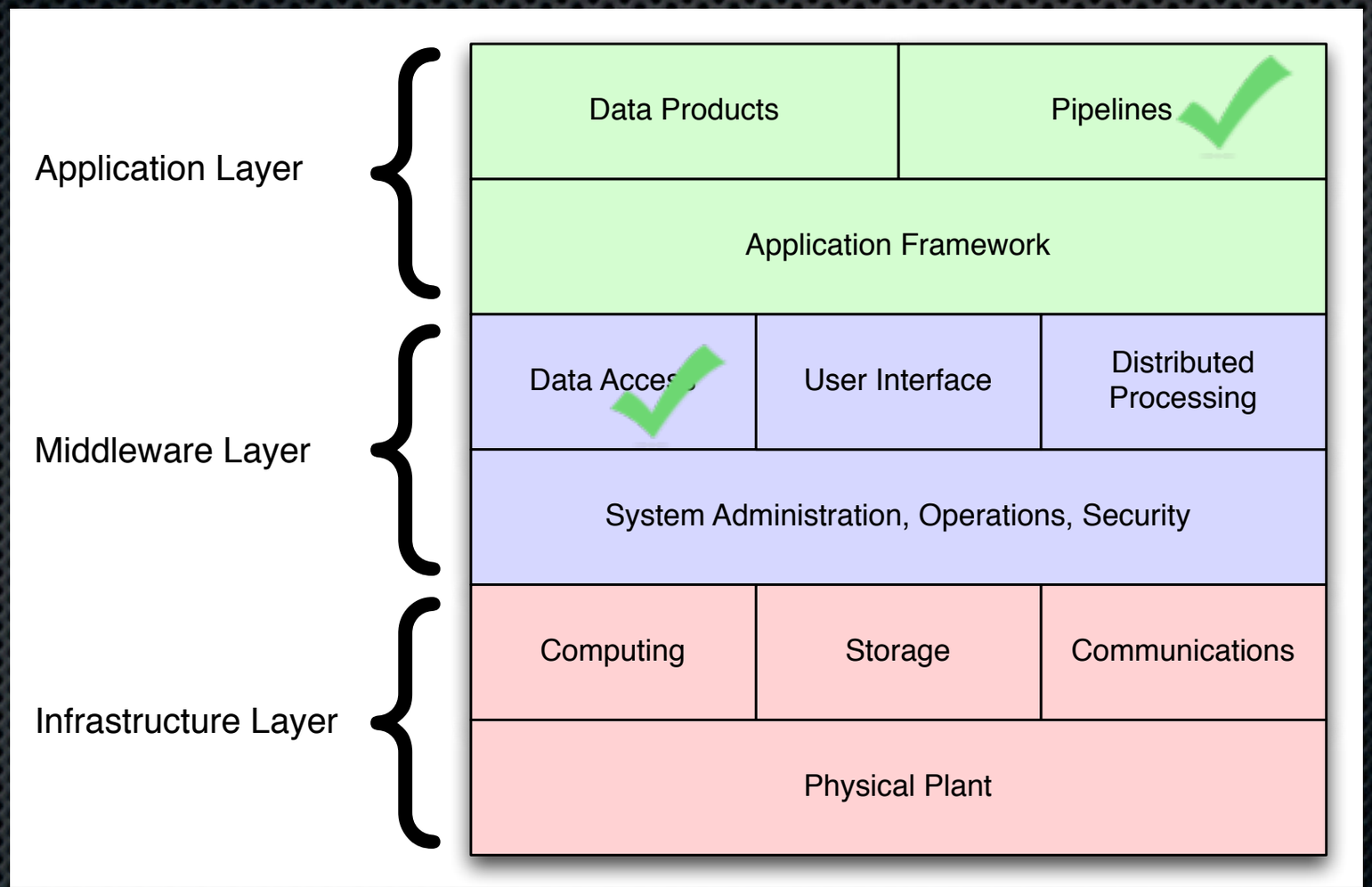

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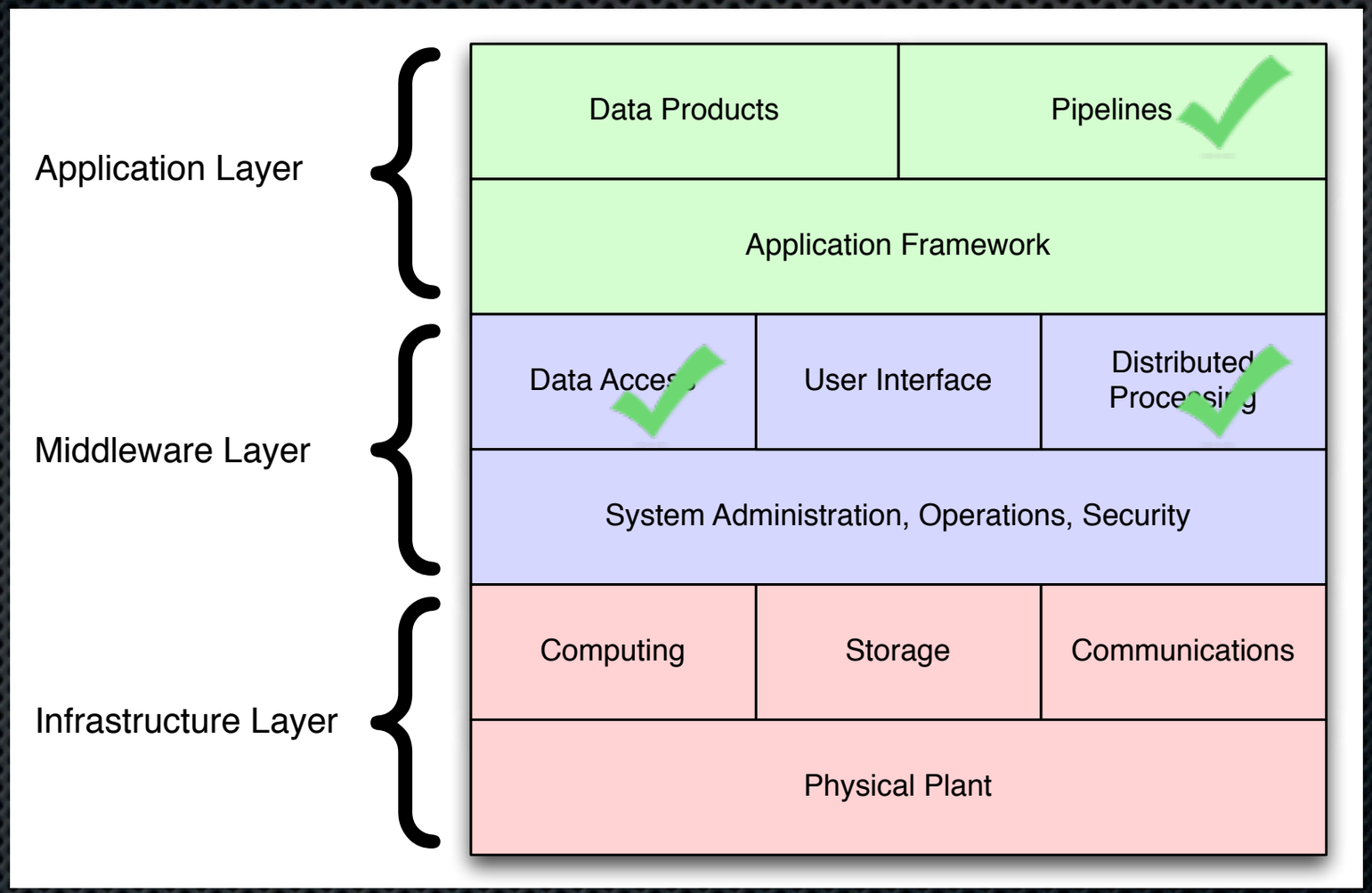

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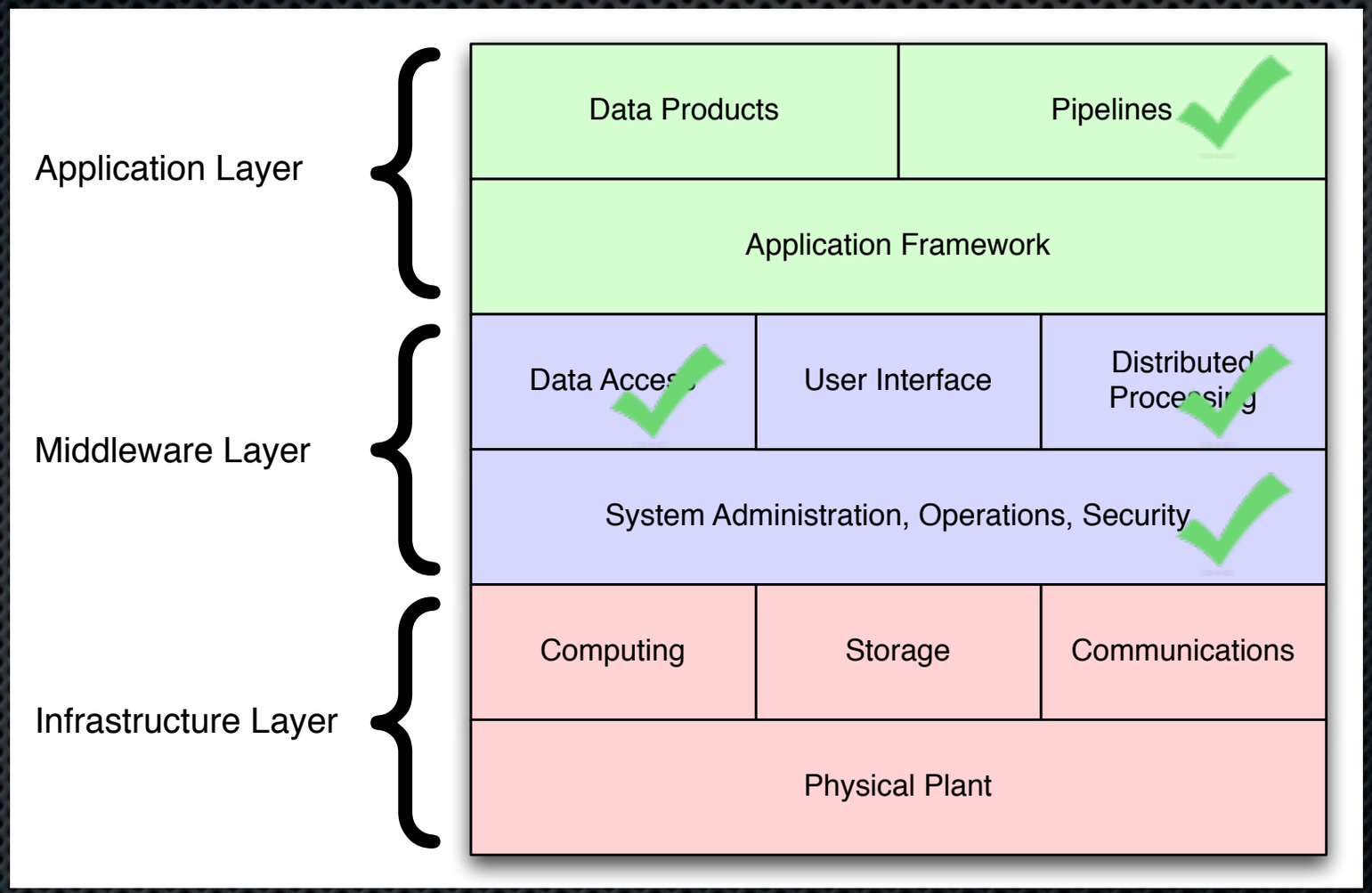

Example: MPI

- mpi_example.py

It’s the same!

- Same software on the cluster
- Same software on the desktop

Open Astronomy

- Open source
- Open data

Resources

- http://dev.lsstcorp.org
- http://www.lsst.org
- http://www.gmto.org