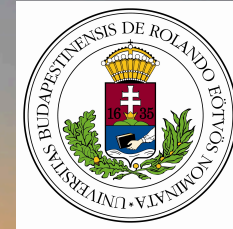


# The PanSTARRS DR1 Data Release



Rick White  
Armin Rest  
Stefano Casertano  
Dave Soderblom  
Jeff Valenti  
Brian McLean  
Bernie Shiao  
Patrick Taylor  
Marc Postman  
... and many others

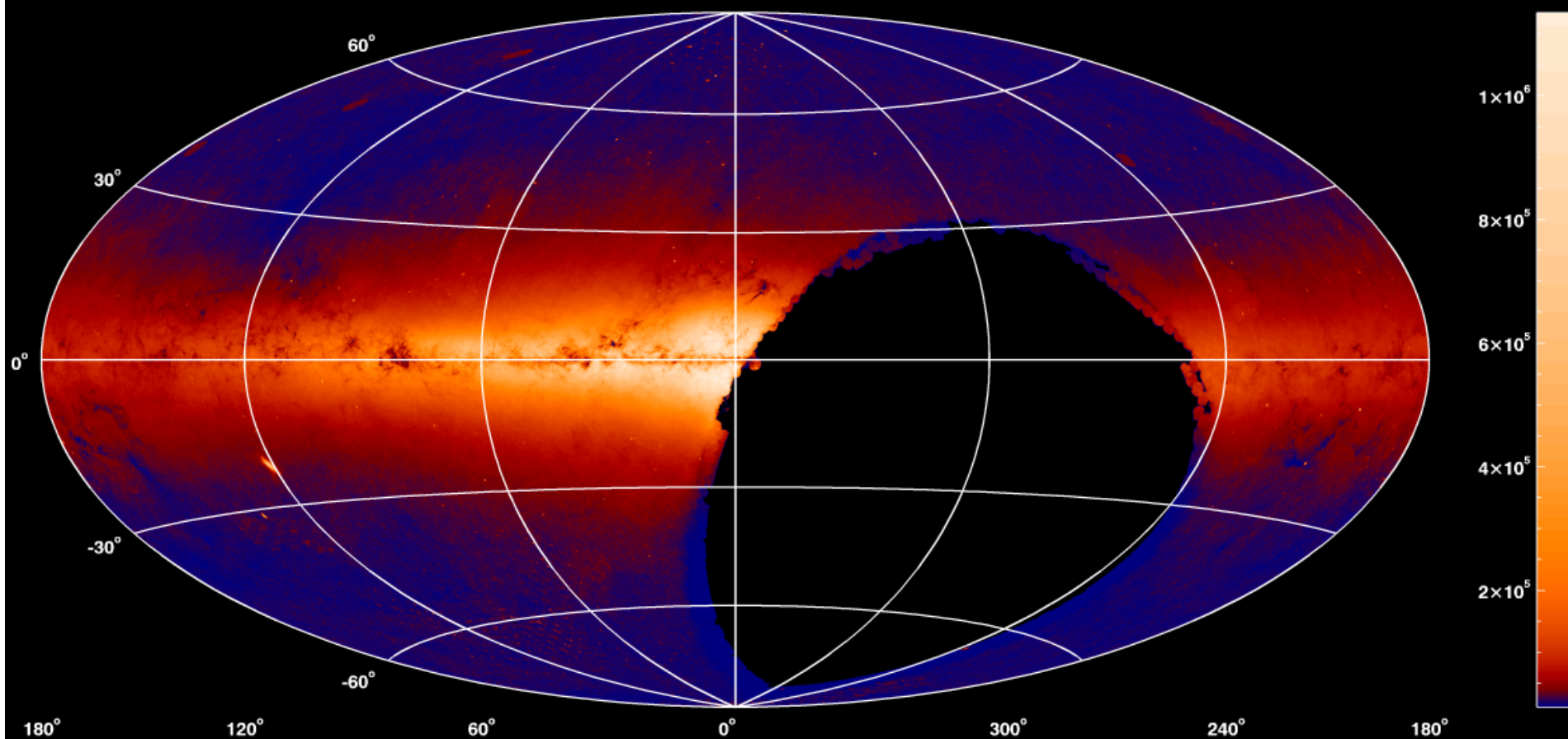
December 2016 MAST Users Group Meeting



# The PS1 public archive

- STScI will provide the public archive for PS1 data
- Planned services:
  - Catalog access
    - Simple form interface
    - Web services (including VO-compatible interfaces)
    - Casjobs SQL query interface
  - Image access
    - Whole images
    - Image cutouts either as FITS files or JPEG previews
    - Interactive display
    - PS1 images as background in MAST Portal
  - We will use products from the PS1 project with existing tools developed by MAST and PS1

# 3PI Object counts, nDetections>2 $1.9 \times 10^9$ objects



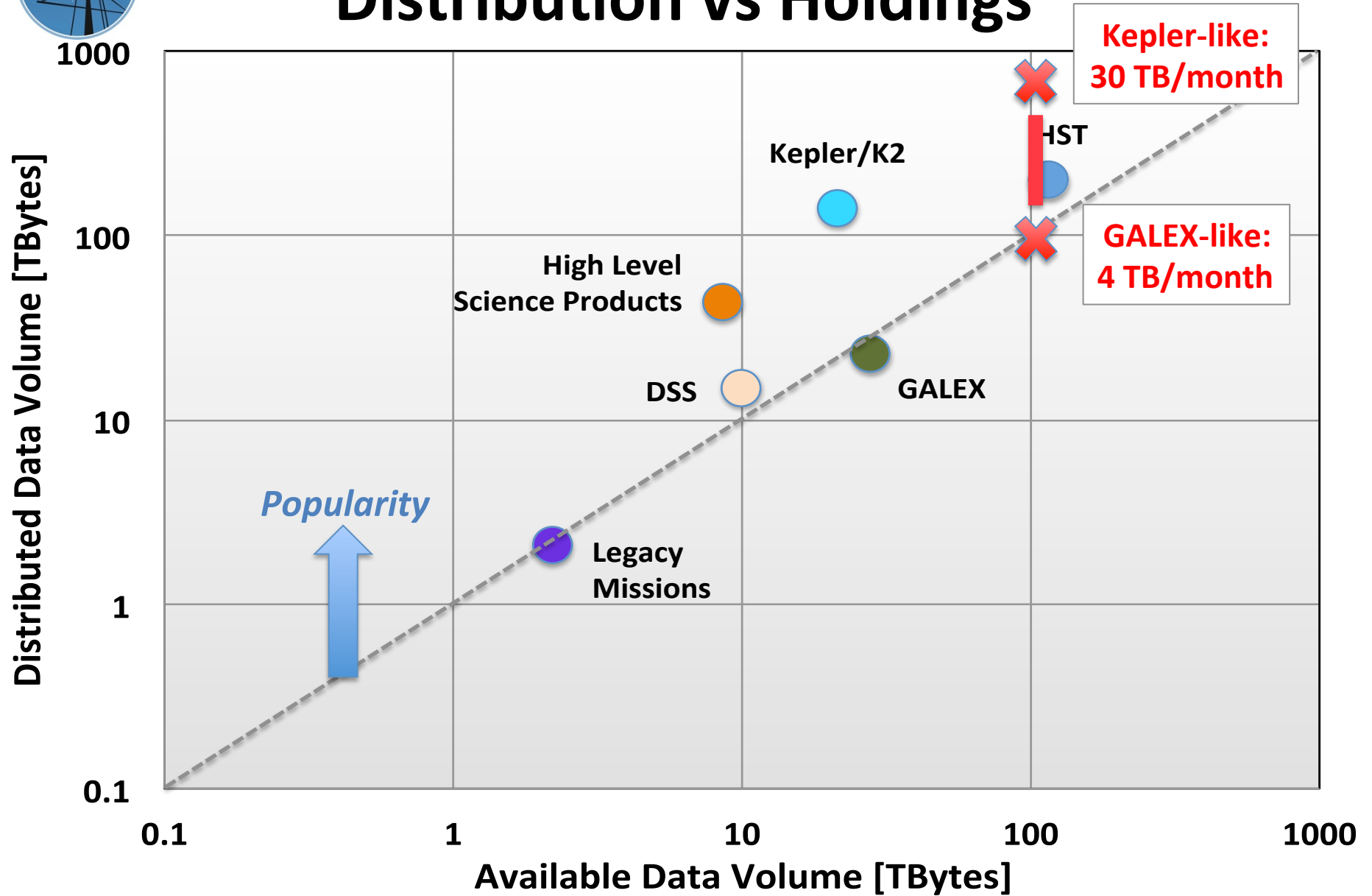
# DR1 and DR2 releases

- We are planning 2 releases
  - DR1: “Static sky” = stacked images, mean object properties, objects detected on stacks
    - Both database and images are smaller by a factor of ~10 compared than the full release
    - 1 million images (100 TB)
    - 11 billion objects (15 TB database)
    - Release date: December 19, 2016
  - DR2: All images and data, including single-epoch images and measurements
    - 22 million images (2 PB)
    - 11 billion objects, 74 billion detections (100 TB database)
    - Release date: May 2017 (more speculative)



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# Distribution vs Holdings

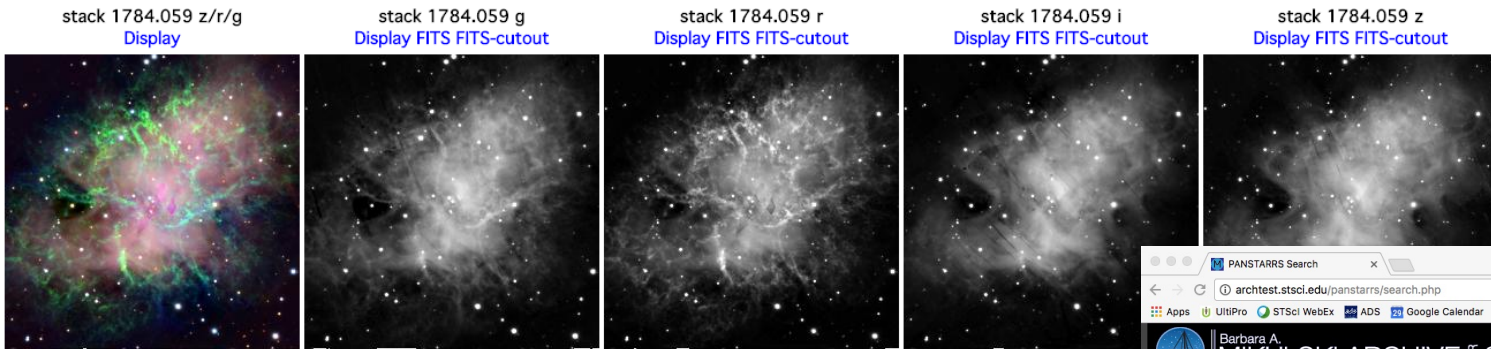




# PanSTARRS1 3PI Image Access

crab nebula  
Filters:  color  g  r  i  z  y  
File types:  stack  warp  
Auxiliary data:  data  mask  wt  exp  expwt  num  
Cutout image size: 1280 pixels (320.00 arcsec) (sets spatial size of the FITS image)  
JPEG display size: 256 pixels (sets resolution of the JPEG previews)

crab nebula (ra = 83.633210, dec = 22.014460)



Stacked (DR1) images are relatively easy for users to handle. Users likely to make requests for images as well as submit queries to the DR1 database.

MAST Catalog Query Form for DR1:

Barbara A. MIKULSKI ARCHIVE OF SPACE TELESCOPES  
PanSTARRS Catalog Search  
Standard Form File Upload Form  
Search  
Target Name Resolver Radius (arcmin)  
Right Ascension Declination Equinox  
nDetections  
Search Output Columns  
Sort By  
Display Coords: Sexagesimal Degrees Hours  
Search Output Format  
Remove Null Columns Make Rows Distinct Skip formatting  
Maximum Records: 5001  
Records per Page: 500

PanSTARRS Image Access

plpsipp1v.stsci.edu/cgi-bin/ps1/cutouts?pos=crab+nebula&filter=color&filter=r&filetypes=warp&auxiliary=data&size=1280&output\_size=256&verbose=0&autoscale=99.500000&catlist=

**PanSTARRS1 3PI Image Access**

crab nebula

Filters:  color  g  r  i  z  y

File types:  stack  warp

Auxiliary data:  data  mask  wt  exp  expwt  num

Cutout image size: 1280 pixels (sets spatial size of the FITS image)

JPEG display size: 256 pixels (sets resolution of the JPEG previews)

crab nebula (ra = 83.633210, dec = 22.014460)

warp 1784.059 r 55180.48791 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 55192.32810 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 55811.61191 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 55814.57473 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 55891.58405 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 55891.59833 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>
warp 1784.059 r 56238.58456 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56238.59634 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56310.40546 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56310.41759 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56323.35396 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56323.36628 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>
warp 1784.059 r 56735.29197 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>	warp 1784.059 r 56735.29984 <a href="#">Display FITS</a> <a href="#">FITS-cutout</a>				

Single-epoch (DR2) images are complex and will be challenging for users to analyze. Users, thus, likely to mostly rely on DR2 database for science.



# PS1 Archive Funding

- The PS1 public archive is not funded by MAST or NASA
- The Moore Foundation has recently awarded JHU/STScI funding to replace aging PS1 archive hardware (which was purchased from DDRF/JDF funds back in 2013).
  - 2 PB replacement storage to be integrated with our existing EMC Isilon system.
  - 2 to 4 new database servers.



# Demos

- [Image cutout server](#)
- [Catalog search form](#)
- [PS1 in Astroview](#)