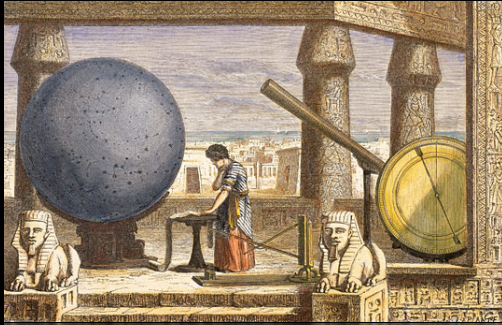


# 3500 years of Observing

Stonehenge, 1500 BC



Ptolemy in Alexandria, 100 AD



Observatory Tower, Lincolnshire, UK, c. 1300



Galileo, 1600



The "Scientific Revolution"

Reber's Radio Telescope, 1937



NASA/Explorer 7  
(Space-based  
Observing)  
1959

"The Internet"



Long-distance  
remote-control/  
"robotic"  
telescopes  
1990s

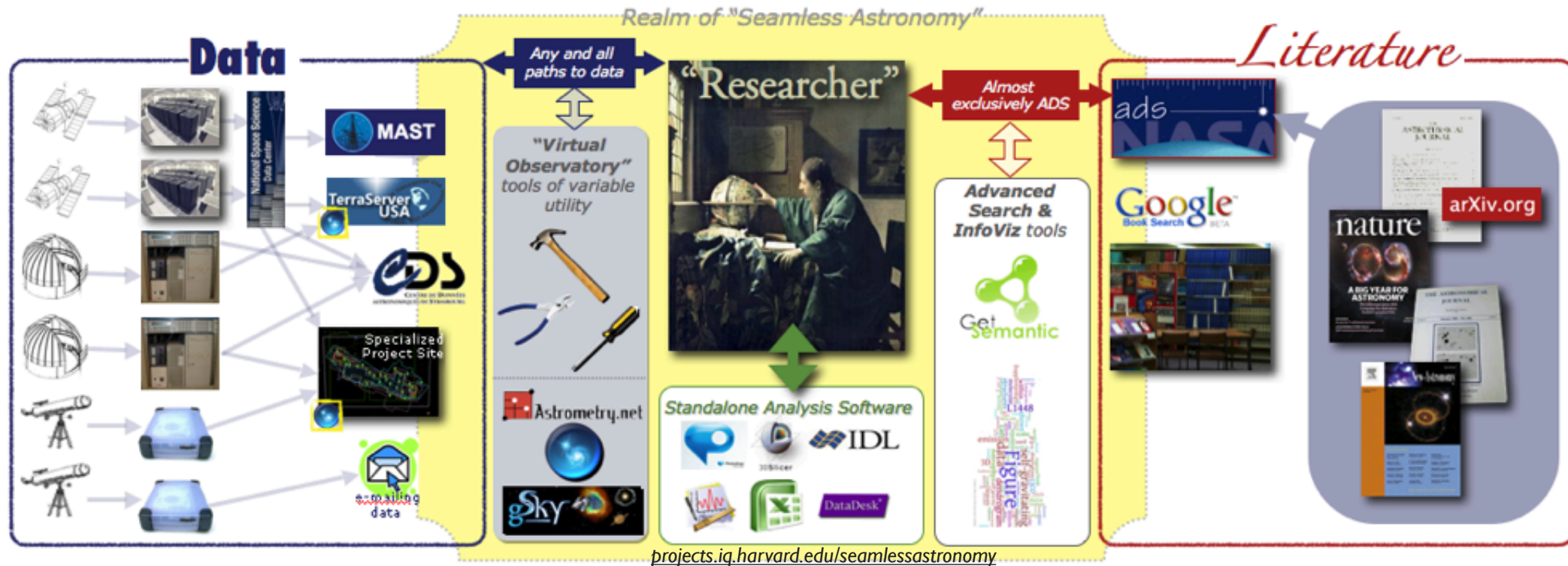


Virtual  
astronomy

Heidelberg 2012

# SEAMLESS ASTRONOMY+

Alyssa A. Goodman, Harvard-Smithsonian Center for Astrophysics

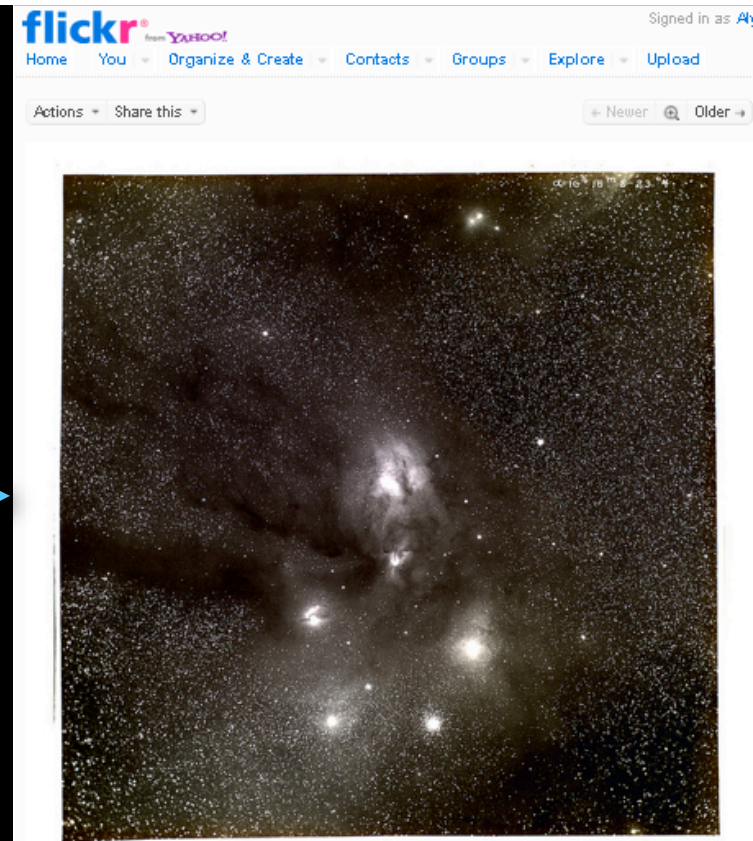
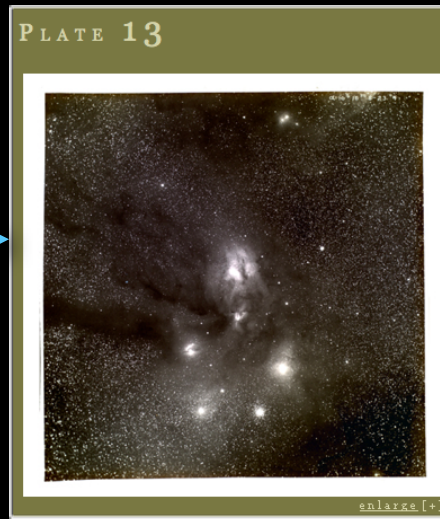
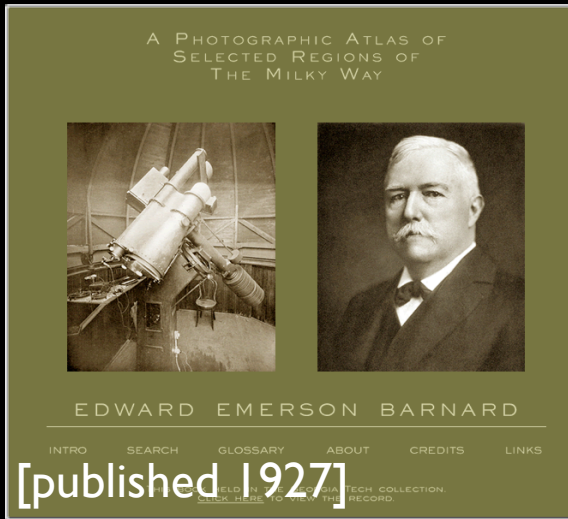


with Alberto Accomazzi, Douglas Burke, Raffaele D'Abrusco, Rahul Davé, Christopher Erdmann, Pepi Fabbiano, Edwin Henneken, Jay Luker, Gus **Muench**, Michael Kurtz, Max Lu, Victoria Mittelbach, Alberto **Pepe**, Arnold Rots, Patricia Udomprasert (Harvard-Smithsonian CfA); Christopher **Baumont** (CfA & U. Hawaii); Michelle **Borkin** (Harvard SEAS); Mercé Crosas (Harvard Institute for Quantitative Social Science); Christine Borgman (UCLA); Thomas **Robitaille** (MPIA); Jonathan Fay & Curtis Wong (Microsoft Research); Alberto Conti (Space Telescope Science Institute)



# “Seamless Astronomy” [a cute example]


astrometry.net + flickr + WWT



## barnardoph

E.E. Barnard's image of Ophiuchus  
[www.library.gatech.edu/bpdi/bpdi.php](http://www.library.gatech.edu/bpdi/bpdi.php)

## Comments and faves astrometry.net

 astrometry.net (6 days ago | reply | delete)

Hello, this is the blind astrometry solver. Your results are:  
 (RA, Dec) center:(246.421365149, -23.6749819397) degrees  
 (RA, Dec) center (H.M.S, D.M.S):(16:25:41.128, -23:40:29.935)  
 Orientation:178.34 deg E of N

Pixel scale:52.94 arcsec/pixel  
 Parity:Reverse ("Left-handed")  
 Field size :9.41 x 9.41 degrees

Your field contains:  
 The star Antares (α Sco)  
 The star Graffias (β1 Sco)  
 The star Al Niyat (σ Sco)  
 The star τ Sco  
 The star ω1 Sco  
 The star ν Sco  
 The star ω2 Sco  
 The star ω Oph  
 The star 13 Sco  
 The star ο Sco  
 IC 4592  
 IC 4601  
 NGC 6121 / M 4  
 IC 4603  
 IC 4604 / the Oph nebula  
 IC 4605

[View in World Wide Telescope](#)

# Literature

# "Seamless Astronomy" (Tools)

# Data



Blogs, Wikis, etc.



SAMP



WorldWide Telescope



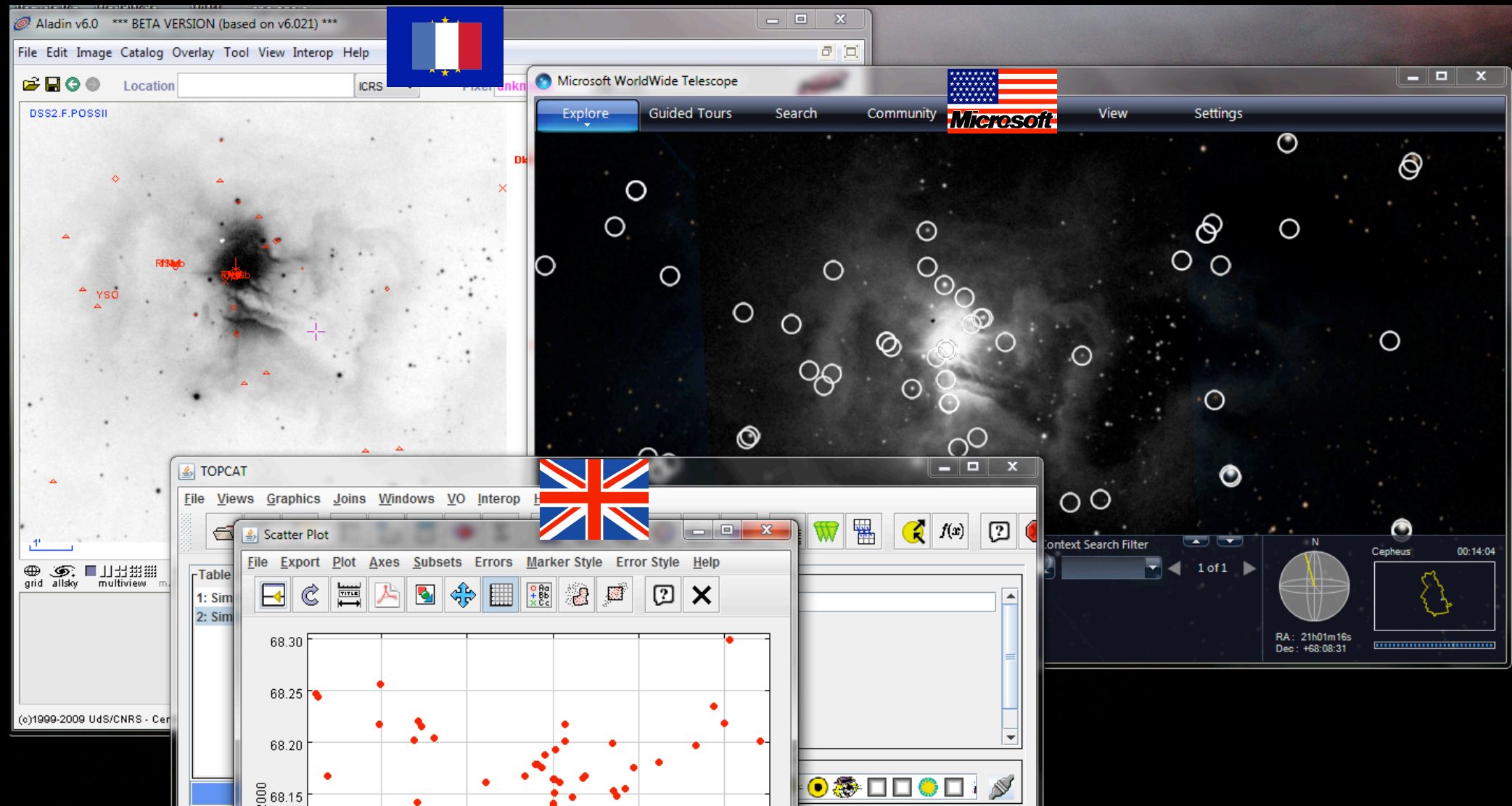
Registries



**Disclaimer:** This slide shows key excerpts from within the astronomy community & excludes more general s/w that is used, such as Papers, Zotero, Mendeley, EndNote, graphing & statistics packages, data handling software, search engines, etc.

# SAMP

(Simple Application Messaging Protocol)



[link to 12/2010 IVOA recommendation](#)



# SEAMLESS ASTRONOMY

Linking scientific data, publications, and communities



ABOUT PROJECTS PEOPLE RESOURCES DATAVERSE

## SEAMLESS ASTRONOMY

### About



The **Seamless Astronomy Group** at the **Harvard-Smithsonian Center for Astrophysics** brings together astronomers, computer scientists, information scientists, librarians and visualization experts involved in the development of tools and systems to study and enable the next generation of **online astronomical research**.

Current projects include research on the development of systems that seamlessly integrate scientific data and literature, the semantic interlinking and annotation of scientific resources, the study of the impact of social media and networking sites on scientific dissemination, and the analysis and visualization of astronomical research communities. Visit our [project page](#) to find out more.

SHARE [Facebook] [Twitter] [Email] ...

### Latest Announcements

Introducing the Astronomy Dataverse

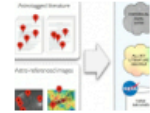
### Latest Feed Items

@rahuldave there is a writeboard with my notes... More at next #seamlessastronomy next week.

Thanks to @astrobites and @astroknight06 for great summary <http://t.co/jWWFT0CD> of our High-D Data Viz work! #ivoa #seamlessastronomy

# SEAMLESS ASTRONOMY



Projects




ADS Labs



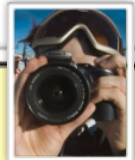

ADS All Sky Survey



Astronomy Dataverse



WorldWide Telescope



High-D Visualization

Social Networks

Collaboration Networks

Data Citation

Semantic Search

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hosted by Harvard University and managed by the Institute for Quantitative Social Science (IQSS), as a project-based repository for the storage, access, and citation of reduced astronomical data. We have interviewed a set of 10 astronomers about their needs, and the prototype CFA Dataverse is now online.

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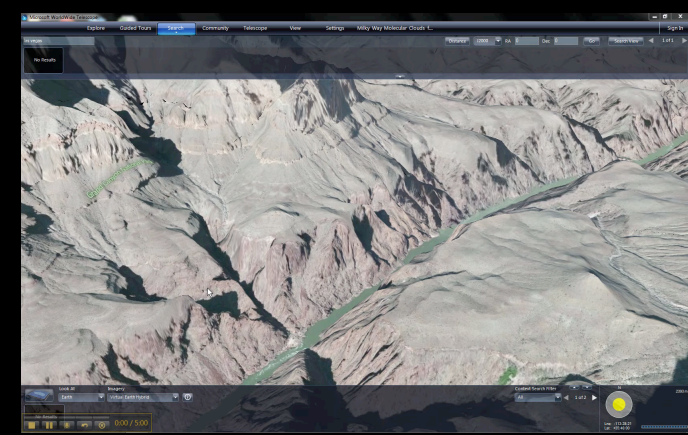
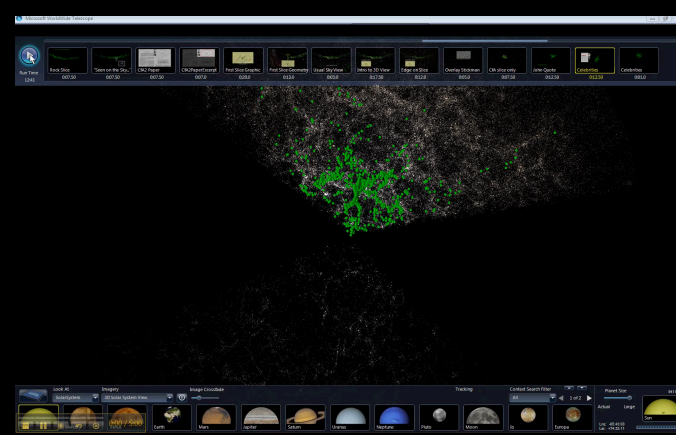
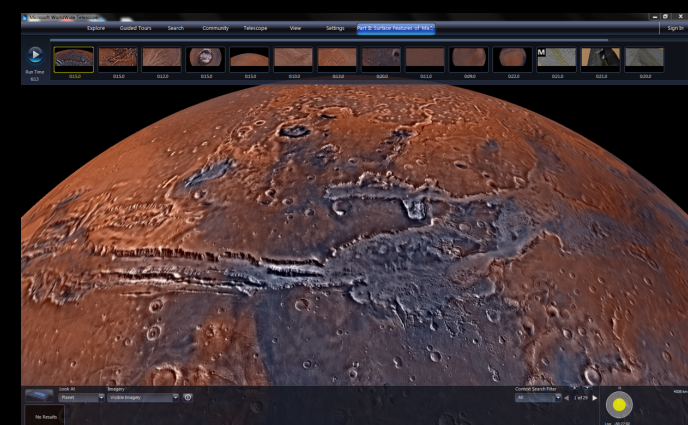
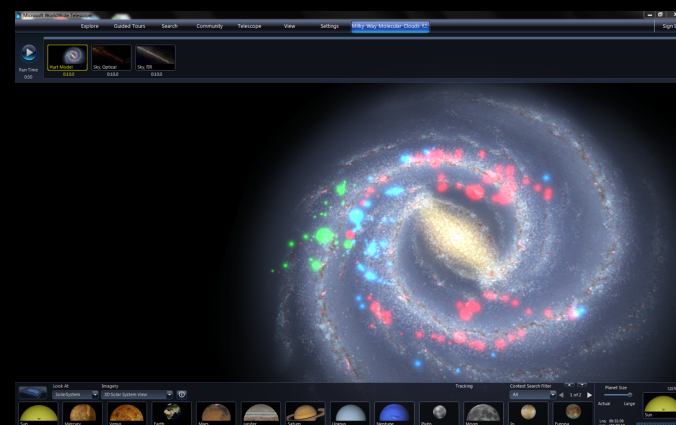
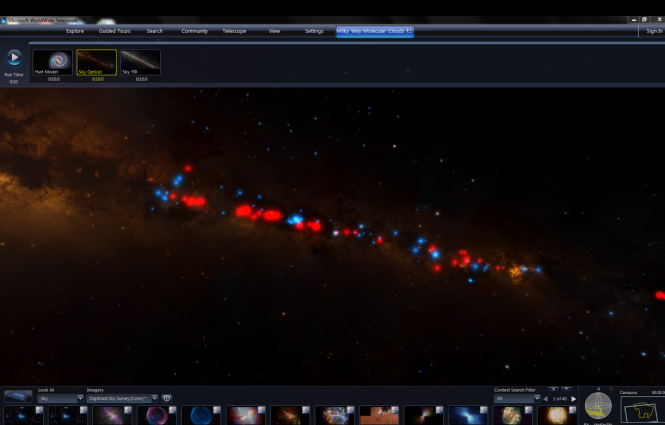
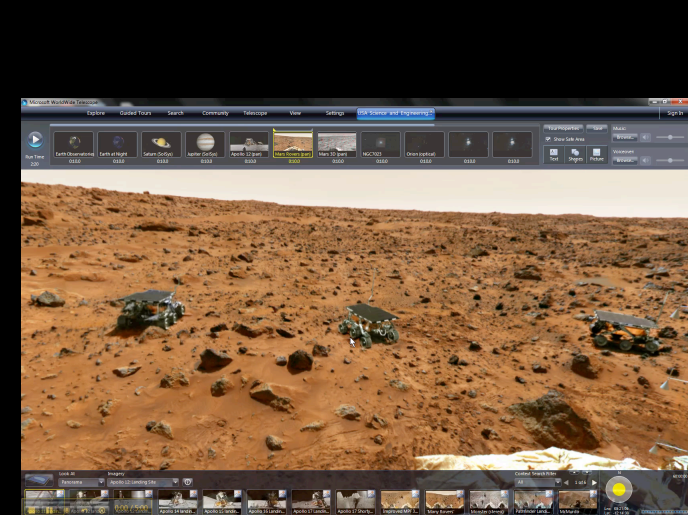
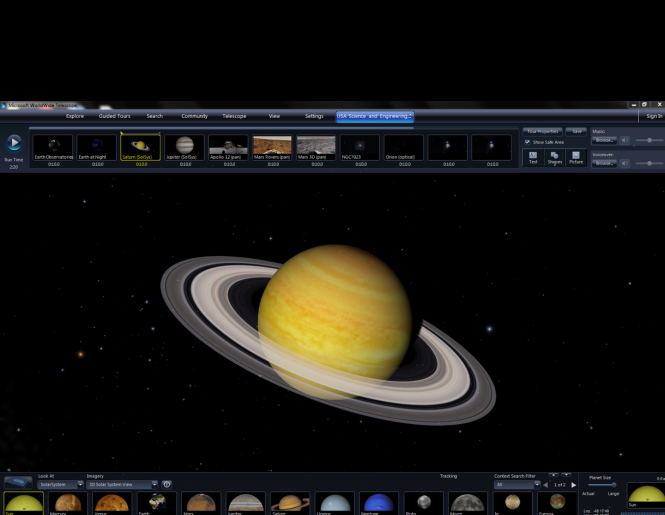
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Experience WWT at [worldwidetelescope.org](http://worldwidetelescope.org)





# The WorldWide Telescope Ambassadors Program



## WorldWide Telescope Ambassadors

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AMBASSADORS
COMMUNITY
GET WWT



### Spring 2012 Update

Submitted by patudom on May, 9



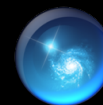
WWT Ambassadors have had a busy and productive spring! We demo'ed WWT at the [USA Science and Engineering Festival](#) and two local science festival events in Cambridge to engaged and enthusiastic crowds of close to 2000 people. The most common refrain we heard was, "Really? I can download this at home for free?" Ambassadors continue to be impressed by the astute questions and observations made by children who are given the opportunity to explore our universe for the first time. "Why is Pluto's orbit so out of whack from all the other planets?" "Why does Jupiter have so many more moons than other planets?" "How long would it take for us to travel far enough outside the Milky Way to take a picture of it?"

[wwtambassadors.org](http://wwtambassadors.org)

[Login or register to post comments](#) [Read more](#)

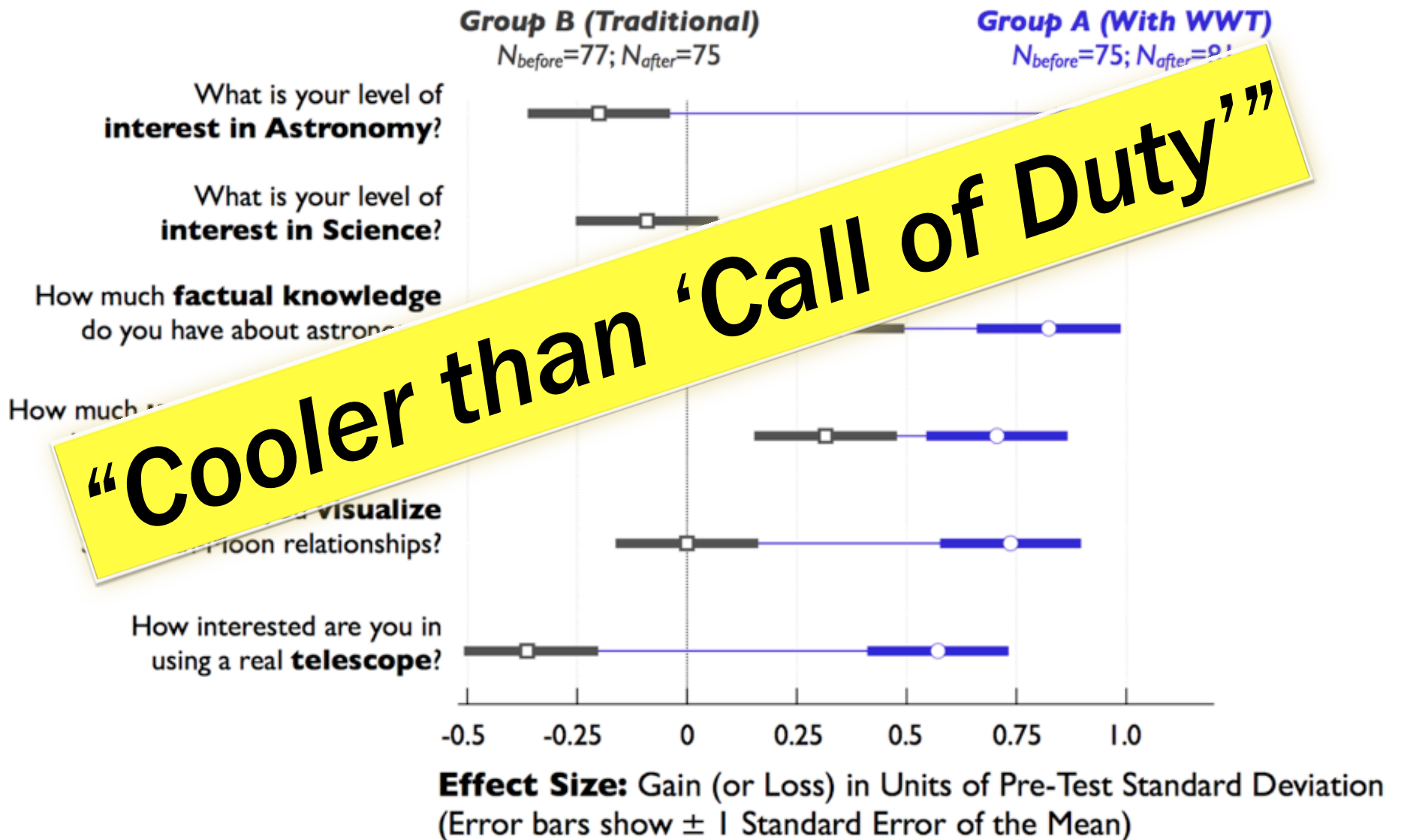


**Alyssa Goodman & Patricia Udomprasert**  
*Harvard-Smithsonian Center for Astrophysics*



**Curtis Wong & Jonathan Fay**  
*Microsoft Research*

# Gains in Student Interest and Understanding (“Traditional Way” vs “WWT Way”)

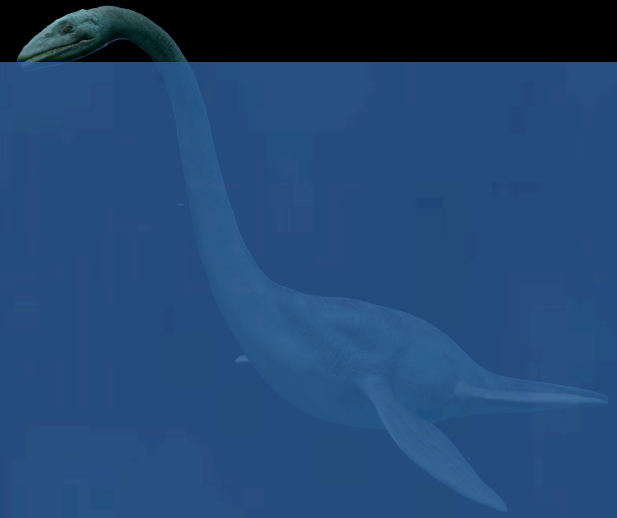


**What I did (or want to do) on my Summer Vacation...**

---

**A “Seamless Astronomy” Story about the Galaxy**

**Once upon a time in an enchanted castle by a lake, a sea monster...**





## THE “NESSIE” NEBULA: CLUSTER FORMATION IN A FILAMENTARY INFRARED DARK CLOUD

JAMES M. JACKSON<sup>1</sup>, SUSANNA C. FINN<sup>1</sup>, EDWARD T. CHAMBERS<sup>2</sup>, JILL M. RATHBORNE<sup>3</sup>, AND ROBERT SIMON<sup>4</sup>

<sup>1</sup> Institute for Astrophysical Research, Boston University, Boston, MA 02215, USA; [jackson@bu.edu](mailto:jackson@bu.edu), [sfinn@bu.edu](mailto:sfinn@bu.edu)

<sup>2</sup> Department of Physics and Astronomy, Northwestern University, Evanston, IL 60208, USA; [e-chambers@northwestern.edu](mailto:e-chambers@northwestern.edu)

<sup>3</sup> Australia Telescope National Facility and Universidad de Chile, Santiago, Chile; [rathborn@das.uchile.cl](mailto:rathborn@das.uchile.cl)

<sup>4</sup> I. Physikalisches Institut, Universität zu Köln, 50937 Köln, Germany; [simonr@ph1.uni-koeln.de](mailto:simonr@ph1.uni-koeln.de)

*Received 2010 April 13; accepted 2010 July 21; published 2010 August 3*

### ABSTRACT

The “Nessie” Nebula is a filamentary infrared dark cloud (IRDC) with a large aspect ratio of over 150:1 ( $1^{\circ}5 \times 0^{\circ}01$  or  $80 \text{ pc} \times 0.5 \text{ pc}$  at a kinematic distance of 3.1 kpc). Maps of HNC (1–0) emission, a tracer of dense molecular gas, made with the Australia Telescope National Facility Mopra telescope, show an excellent morphological match to the mid-IR extinction. Moreover, because the molecular line emission from the entire nebula has the same radial velocity to within  $\pm 3.4 \text{ km s}^{-1}$ , the nebula is a single, coherent cloud and not the chance alignment of multiple unrelated clouds along the line of sight. The Nessie Nebula contains a number of compact, dense molecular cores which have a characteristic projected spacing of  $\sim 4.5 \text{ pc}$  along the filament. The theory of gravitationally bound gaseous cylinders predicts the existence of such cores, which, due to the “sausage” or “varicose” fluid instability, fragment from the cylinder at a characteristic length scale. If turbulent pressure dominates over thermal pressure in Nessie, then the observed core spacing matches theoretical predictions. We speculate that the formation of high-mass stars and massive star clusters arises from the fragmentation of filamentary IRDCs caused by the “sausage” fluid instability that leads to the formation of massive, dense molecular cores. The filamentary molecular gas clouds often found near high-mass star-forming regions (e.g., Orion, NGC 6334, etc.) may represent a later stage of IRDC evolution.

*Key words:* ISM: clouds – stars: formation

**Ringberg Castle, Bavaria**  
**“Early Phases of Star Formation”**  
**July 2012**



**QUESTION** *Andi Burkert*: Is Nessie “parallel to the Galactic Plane”?

**ANSWER** *no one* immediately knew the answer!

AG decides to look into this and...

# Quick GLIMPSE (thanks Tom Robitaille)

<http://www.alienearths.org/glimpse/>

The screenshot displays the GLIMPSE | MIPSGAL VIEWER interface. At the top left, there is a logo and the text "GLIMPSE | MIPSGAL VIEWER". To the right of the logo are three buttons: "LINK TO CURRENT VIEW", "TOGGLE PINS", and "QUESTIONS?". Below these buttons is a horizontal bar with a green gradient. The main area is a large image of a star field with a red and orange color palette. A green box highlights a specific region in the upper part of the image. A blue dinosaur-like creature is overlaid on the right side of the image. In the top right corner of the main image area, there is a button labeled "COORDINATES". At the bottom of the main image area, there is a control bar with a question mark icon, a slider labeled "IRAC" and "IRAC/MIPS", and a set of navigation icons including zoom in (+), zoom out (-), pan left, pan up, pan down, pan right, and refresh.

GLIMPSE | MIPSGAL VIEWER

LINK TO CURRENT VIEW TOGGLE PINS QUESTIONS?

COORDINATES

IRAC IRAC/MIPS

©2008 Space Science Institute

back to: [alienearths.org/glimpse](http://www.alienearths.org/glimpse/)



**QUESTION** *Andi Burkert*

Is Nessie “parallel to the Galactic Plane”?

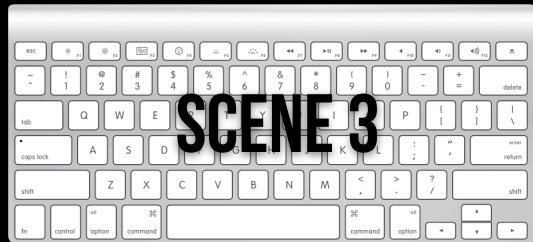
**ANSWER** *Alyssa & Friends*

**Yes**, but it seems to be about 0.4 degrees below it...and, we wonder...



**Yes**, but it seems to be about 0.4 degrees below it... thus, we\* wonder...

What happens if we look more broadly?

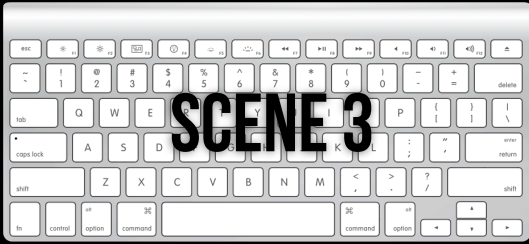


**Quantitative Analysis**  
of Peretto & Fuller 2009 **Catalog**

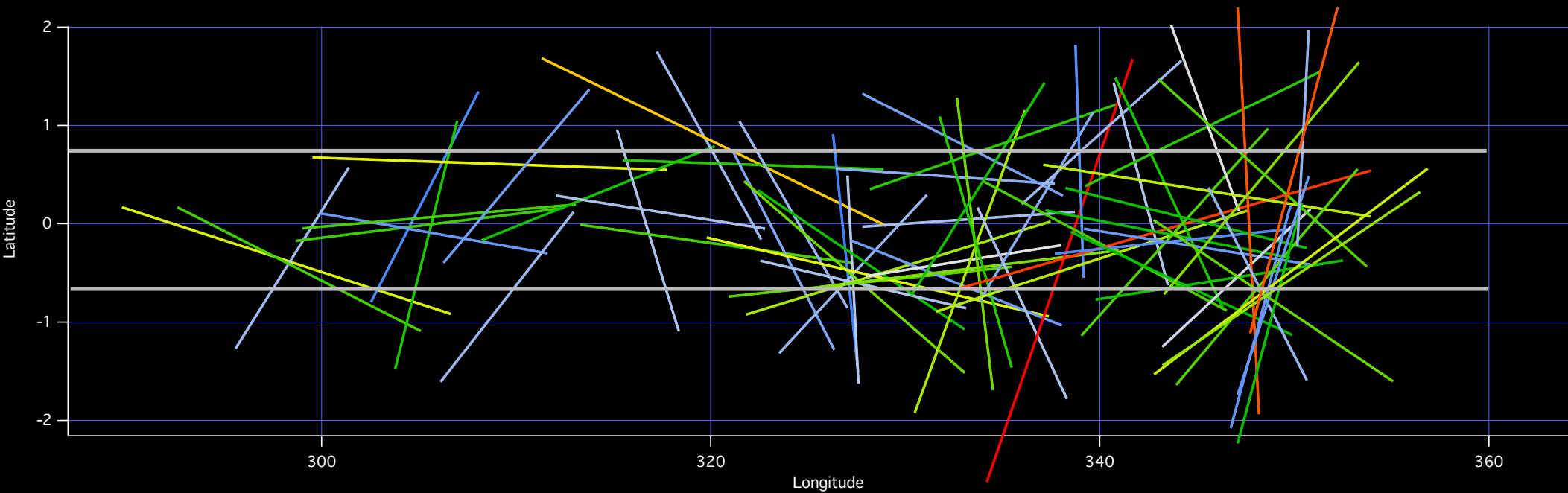


Just **“look”**

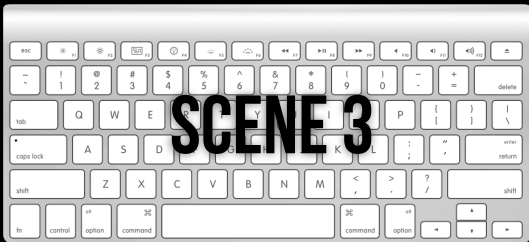
\* “we” later includes Robitaille, Bressert, Alves & Kauffmann (+AG and Burkert)



# Igor (GUI + scripting)

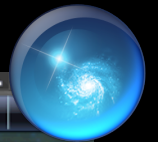


*filtering out only “long” Peretto & Fuller clouds, and showing their orientation (color~length)*



# Huh? Let's look...

WWT



Microsoft WorldWide Telescope

Explore Guided Tours Search Community Telescope View Settings hops test

Run Time 0:30

3D Milky Way 0:10.0 With beer 0:10.0 No beer 0:10.0 Add New Slide

Tour Properties Save Music Show Safe Area Browse... Voiceover: Browse... Text Shapes Picture

Layers

- Sun
  - Mercury
  - Venus
  - Earth
  - Mars
  - Jupiter
  - Saturn
  - Uranus
  - Neptune
  - Pluto
- Sky
  - Overlays
    - 3d Solar System
      - perettowwiflong.xml
      - peretto.xml
    - HOPS
  - Dome

Name	Value
Glon	340.2600
Glat	-0.2237
RAJ2000	252.22437
DEJ2000	-45.19194
Seq	10358
Name	340.260-0.223
RAJ2000	16.48.53.85
DEJ2000	-45.11.31.0
lmin	49.8
lMIR	99.2

Time Scrubber 9999/12/31 23:59:59 0001/01/01

Time Series Auto Loop Delete Add Paste Reset

Look At Sky Imagery Digitized Sky Survey (Color) Image Crosstade

Context Search Filter All 1 of 1

NGC6200 NGC6204 HR6197

RA: 16h44m02s Dec: -46.34.15

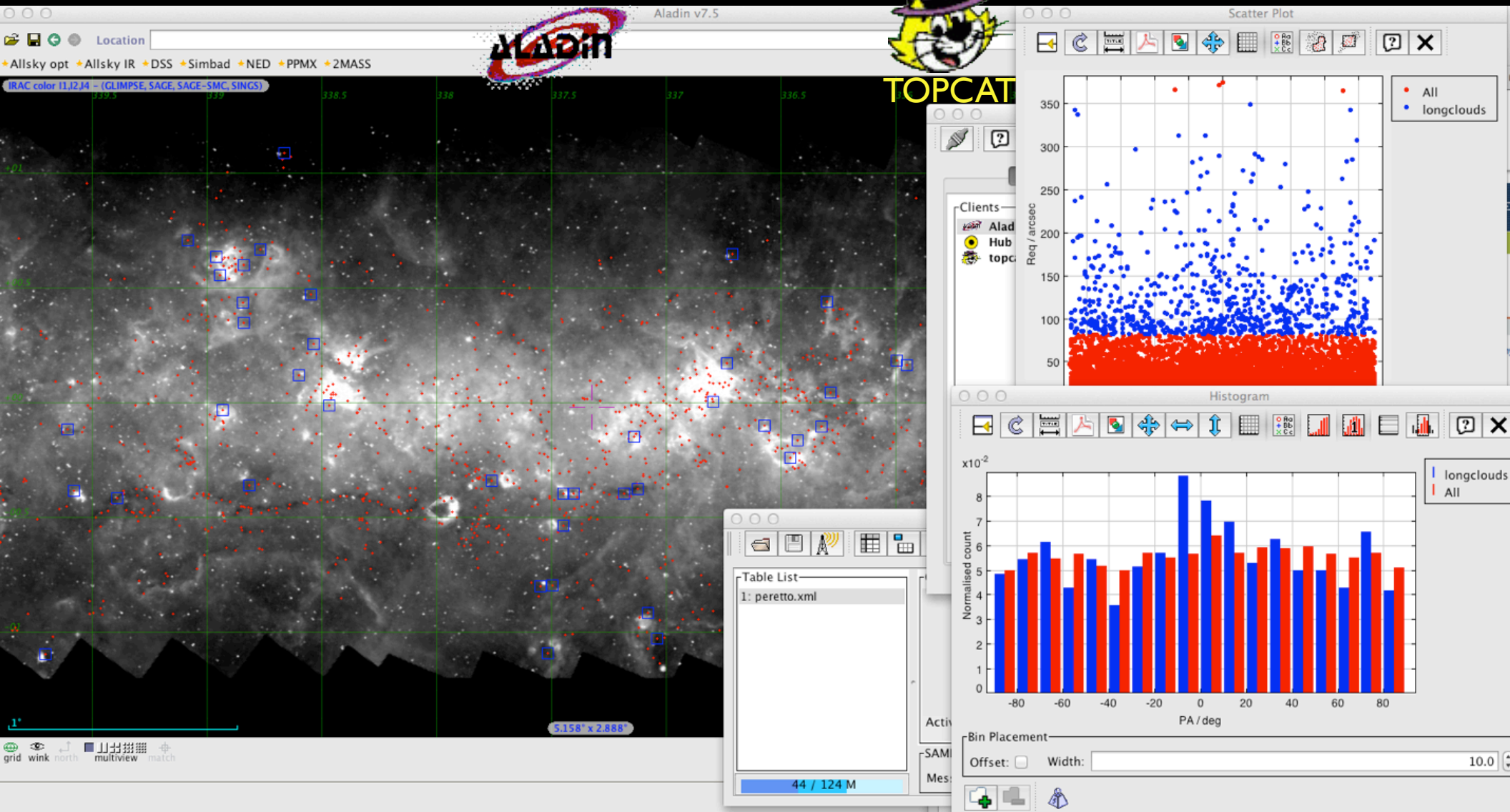
SCENE 3

# Aladin view

The screenshot displays the Aladin web interface for astronomical data visualization. At the top, a keyboard icon is visible. The main window shows a grayscale image of a star field with a green grid overlay. The grid lines are labeled with coordinates: RA values (338.58933, 338.5, 338.41667, 338.33333, 338.25) and Dec values (23.25, 23.175, 23.1, 23.025, 22.95). A toolbar on the right side includes icons for select, pan, zoom, distance measurement, photo, drawing, tagging, filtering, crosshair, sky, RGB, association, crop, contour, pixel, and properties. The bottom right corner features a small inset map showing the current field's location on a celestial sphere with a red dot at the center. A large blue arrow labeled 'SAMP' points towards this inset map. The interface also includes a search bar at the bottom and a status bar at the very bottom showing '0 sel / 11303 src - 23tps / 101Mb'.

SCENE 3

# Aladin + TOPCAT + SAMP



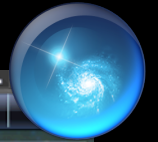
SCENE 3

# Aladin view

The screenshot displays the Aladin astronomical software interface. The main window shows an IRAC4 - 8.0mu image with a green grid overlay. The grid lines are labeled with coordinates: 338.58933, 338.5, 338.41667, 338.33333, 338.25 on the horizontal axis and 00.32, 00.16667, 00.0, 00.16667, 00.32 on the vertical axis. A toolbar on the right contains various icons for selection, panning, zooming, and image processing. A vertical banner on the right side features the Aladin logo and a glass of beer with the text "SCENE 4". The bottom status bar shows the image size as 37.29' x 23.07' and includes a search bar and navigation controls. The footer contains the copyright information: "© 2012 UDS/CNRS - by CDS - Distributed under GNU GPL v3" and system information: "0 sel / 11303 src 23fps / 101Mb".

# Huh? Let's look...

WWT



Microsoft WorldWide Telescope

Explore Guided Tours Search Community Telescope View Settings hops test

Run Time 0:30

3D Milky Way 0:10.0 With beer 0:10.0 No beer 0:10.0 Add New Slide

Tour Properties Save Music Show Safe Area Browse... Voiceover: Browse... Text Shapes Picture

Layers

- Sun
  - Mercury
  - Venus
  - Earth
  - Mars
  - Jupiter
  - Saturn
  - Uranus
  - Neptune
  - Pluto
- Sky
  - Overlays
    - 3d Solar System
    - perettowwifong.xml
    - peretto.xml
    - HOPS
  - Dome

Name	Value
Glon	340.2600
Glal	-0.2237
RAJ2000	252.22437
DEJ2000	-45.19194
Seq	10358
Name	340.260-0.223
RAJ2000	16.48.53.85
DEJ2000	-45.11.31.0
lmin	49.8
lMIR	99.2

Time Scrubber 9999/12/31 23:59:59 0001/01/01

Time Series Auto Loop

Delete Add Paste Reset

Look At Sky Imagery Digitized Sky Survey (Color) Image Crosstide

Context Search Filter All 1 of 1

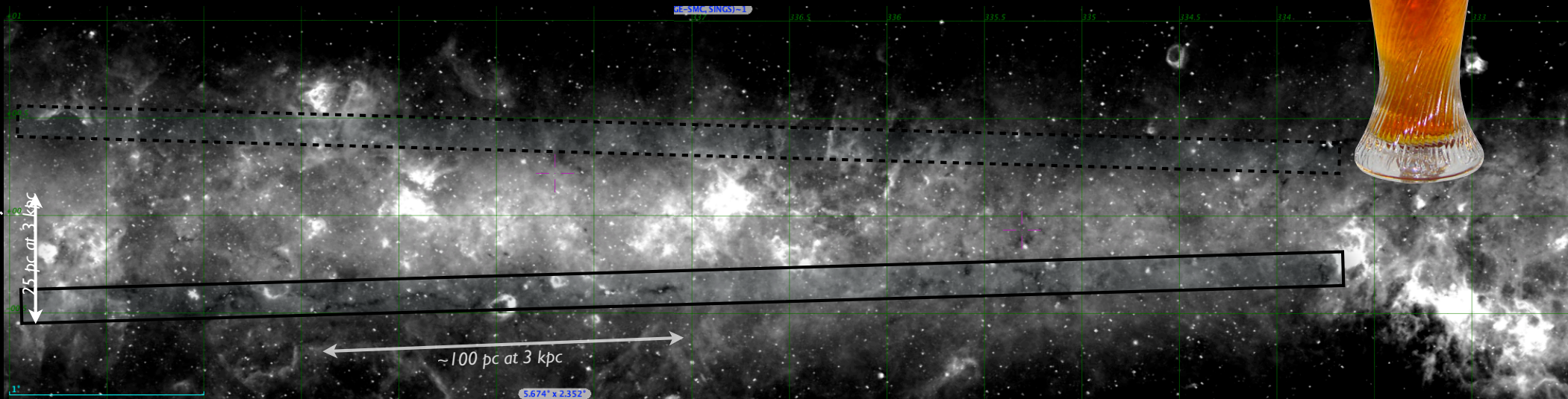
RA: 16h44m02s Dec: -46.34.15

NGC6200 NGC6204 HR6197



SCENE 4

# Pre-publication Composite for Analysis



full box length  $\sim 7$  degrees  $\sim 350$  pc at  
3 kpc

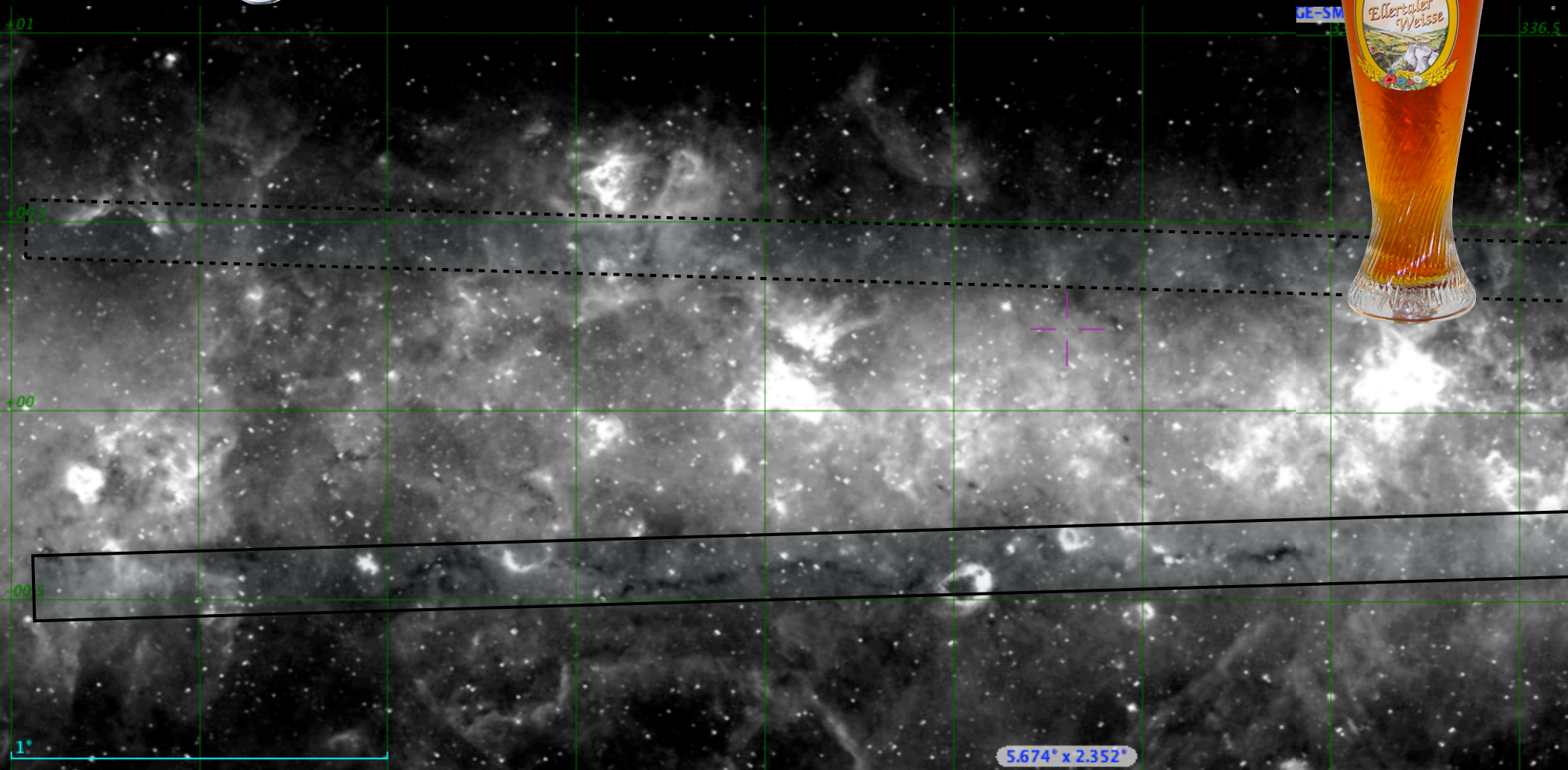




# Pre-publication Composite for Analysis



SCENE 4



Cygnus Arm

Carina-Sagittarius Arm

Norma Arm

SCENE 4



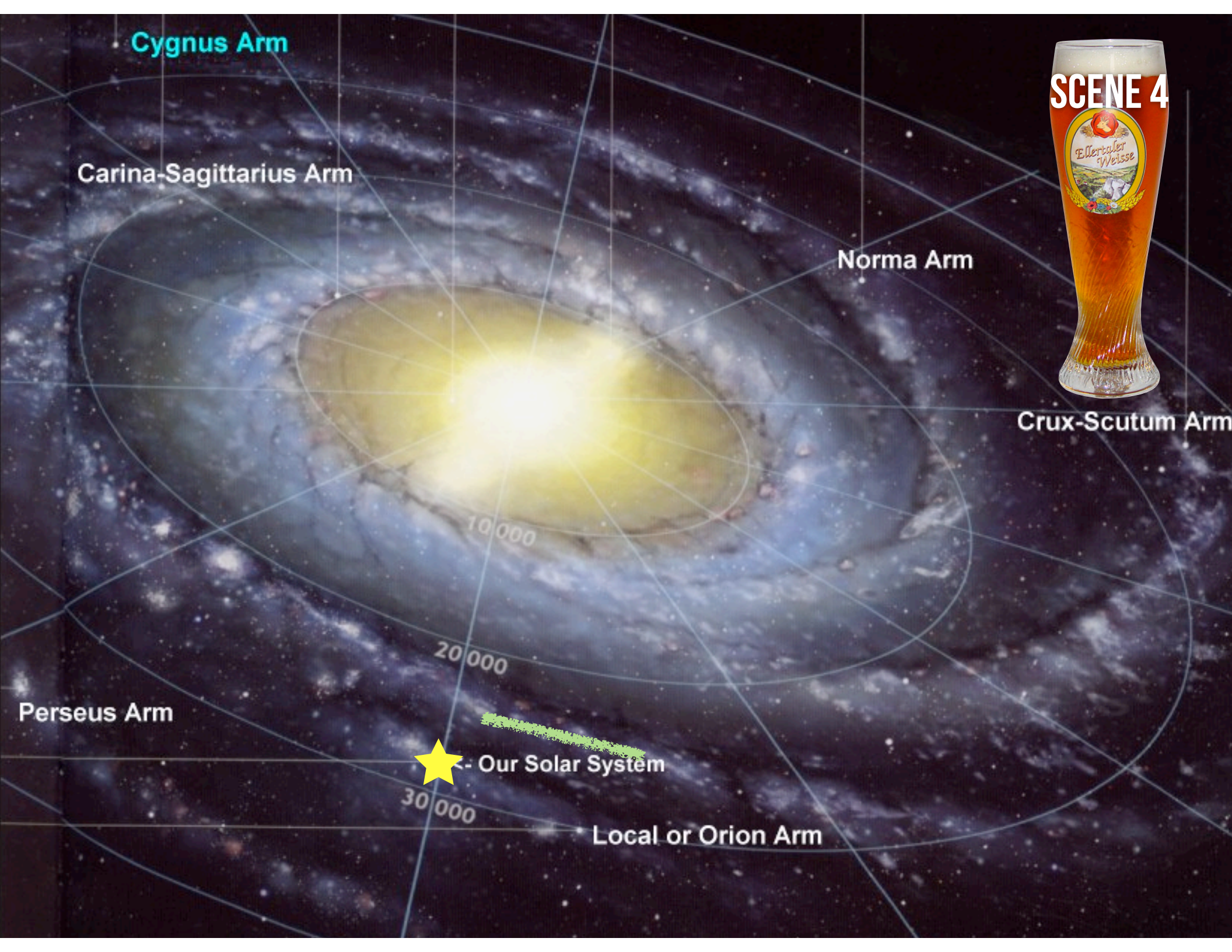
Crux-Scutum Arm

Perseus Arm

10 000  
20 000  
30 000

★ - Our Solar System

Local or Orion Arm



Cygnus Arm

Carina-Sagittarius Arm

Norma Arm

Crux-Scutum Arm

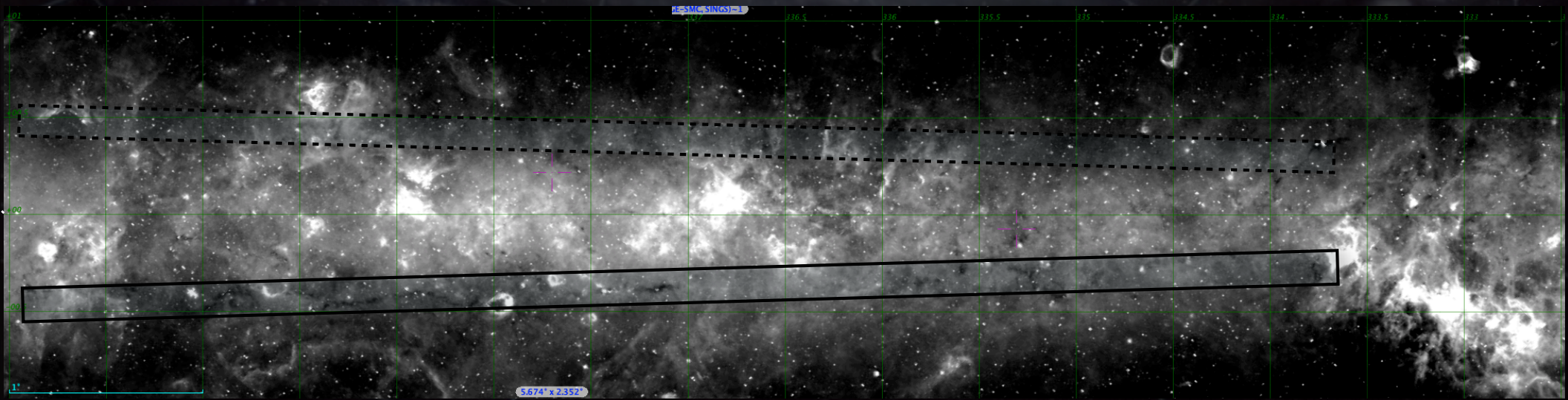


SCENE 4

*Preliminary Interpretation...*

A Galactic "Skin"

**WRONG!**



# SCENE 5 Wising up...(thanks to Jens Kauffmann)

**From:** Kauffmann, Jens (3266-Affiliate) <Jens.Kauffmann@jpl.nasa.gov> Hide  
**Subject:** IRDC Distribution  
**Date:** July 6, 2012 7:44:54 AM GMT+02:00 Inbox - CfAGoogle 1  
**To:** Alyssa Goodman

Hi Alyssa & Andi

I made a quick calculation and the sun is so close that they would appear to be at the true angle will be close to your analysis.

You should have a position above Schuller or Be...

cheers

Jens

**From:** Alyssa Goodman Hide  
**Subject:** Jens is right!  
**Date:** July 6, 2012 10:21:28 AM GMT+02:00 Sent Mail  
**To:** Jens Kauffmann  
**Cc:** Andreas Burkert

Hi Andi,

Jens is right!

Thanks to

A

Alyssa A.  
<http://www.usm.uni-muenchen.de>  
m: 617.230  
(typed on t...

**From:** Andreas Burkert <burkert@usm.uni-muenchen.de> Hide  
**Subject:** Re: Jens is right!  
**Date:** July 6, 2012 10:21:28 AM GMT+02:00  
**To:** Alyssa Goodman  
**Cc:** Jens Kauffmann

I have been thinking about this at the edge of the gas distribution.

Thanks Jens!!!

Cheers, Andi

[See More from Alyssa Goodman](#)

-----  
Prof. Dr. Andre Burkert  
Theoretical and Observational Astronomy  
University of Munich  
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81679 Munich  
Phone: +49 89 30934311  
Fax: +49 89 30934312  
[burkert@usm.uni-muenchen.de](mailto:burkert@usm.uni-muenchen.de)  
<http://www.usm.uni-muenchen.de/~burkert/>  
-----

**From:** Kauffmann, Jens (3266-Affiliate) <Jens.Kauffmann@jpl.nasa.gov> Hide  
**Subject:** Re: Jens is right! Inbox - CfAGoogle 2  
**Date:** July 7, 2012 10:21:28 AM GMT+02:00  
**To:** Alyssa Goodman  
**Cc:** Andreas Burkert <burkert@usm.uni-muenchen.de> , Joao Alves

Hi Alyssa,

happy that I could ... well ... "help". What are your plans how? It is still interesting that all these clouds form one elongated structure. Means they are probably all at the same distance, probably a spiral arm.

A spiral arm position is reasonable and consistent with a few other measures of IRDCs. I believe it was Peretto & Fuller who concluded that the foreground/background ratio for the 8 mu emission towards an IRDC is 1:1. When Thushara and I looked at other galaxies, the 8 mu emission nicely follows spiral arms. If you drop clouds right into the arms, you will directly get a 1:1 ratio.

I wonder whether Jonathan F. does already have distances to all these objects. They are likely to be part of MALT90, and he might have observed them in extinction.

cheers

Jens

[See More from Alyssa Goodman](#)

# SCENE 5 The “Literature” ...special thanks to Henrik Beuther

THE ASTROPHYSICAL JOURNAL, 747:43 (8pp), 2012 March 1

doi:10.1088/0004-637X/747/1/43

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## GALACTIC STRUCTURE BASED ON THE ATLASGAL 870 $\mu\text{m}$ SURVEY

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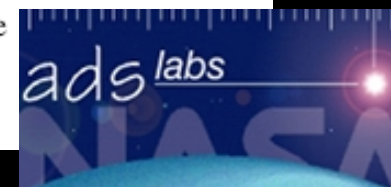
Received 2011 August 11; accepted 2011 December 16; published 2012 February 13

### ABSTRACT

The ATLASGAL 870  $\mu\text{m}$  continuum survey conducted with the APEX telescope is the first one covering the whole inner Galactic plane ( $60^\circ > l > -60^\circ$  and  $b < \pm 1.5^\circ$ ) in submillimeter (submm) continuum emission tracing the cold dust of dense and young star-forming regions. Here, we present the overall distribution of sources within our Galactic disk. The submm continuum emission is confined to a narrow range around the Galactic plane, but shifted on average by  $\sim 0.07$  deg below the plane. Source number counts show strong enhancements toward the Galactic center, the spiral arms, and toward prominent star-forming regions. Comparing the distribution of ATLASGAL dust continuum emission to that of young intermediate- to high-mass young stellar objects (YSOs) derived from *Spitzer* data, we find similarities as well as differences. In particular, the distribution of submm dust continuum emission is significantly more confined to the plane than the YSO distribution (FWHM of 0.7 and 1.1 deg, corresponding to mean physical scale heights of approximately 46 and 80 pc, respectively). While this difference may partly be caused by the large extinction from the dense submm cores, gradual dispersal of stellar distributions after their birth could also contribute to this effect. Compared to other tracers of Galactic structure, the ATLASGAL data are strongly confined to a narrow latitude strip around the Galactic plane.

*Key words:* dust, extinction – Galaxy: structure – ISM: clouds – stars: formation – stars: pre-main sequence

*Online-only material:* color figures



## SCENE 6 EPILOGUE

*The near & slightly farther future...*

### SCIENCE

IRDCs = edge-on column density features in the plane

### DISSEMINATION

*ApJ Letter by Burkert, Goodman, and...*

### POLITICS/CREDIT

+Kauffmann as author (but what about others who helped... Robitaille, Bressert, Alves...)

ADS ALL-SKY SURVEY?

UNIVERSE3D.ORG?

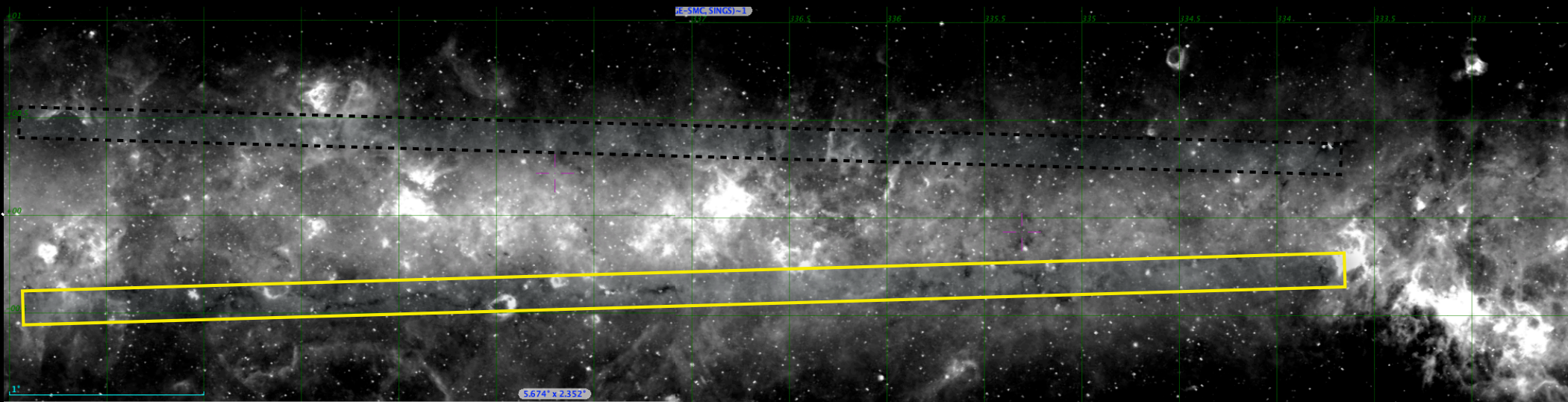
ORCID?

WEB SAMP and GLUE?

“AUTHOREA”? (ask Alberto)

## SCENE 6

*Much better Interpretation...*  
That **is** the galactic plane!



# Literature

# "Seamless Astronomy" (Tools)

# Data



WorldWide Telescope

TOPCAT

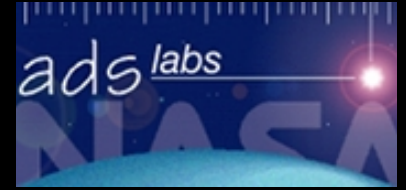


**Disclaimer:** This slide shows key excerpts from within the astronomy community & excludes more general s/w that is used, such as Papers, Zotero, Mendeley, EndNote, graphing & statistics packages, data handling software, search engines, etc.

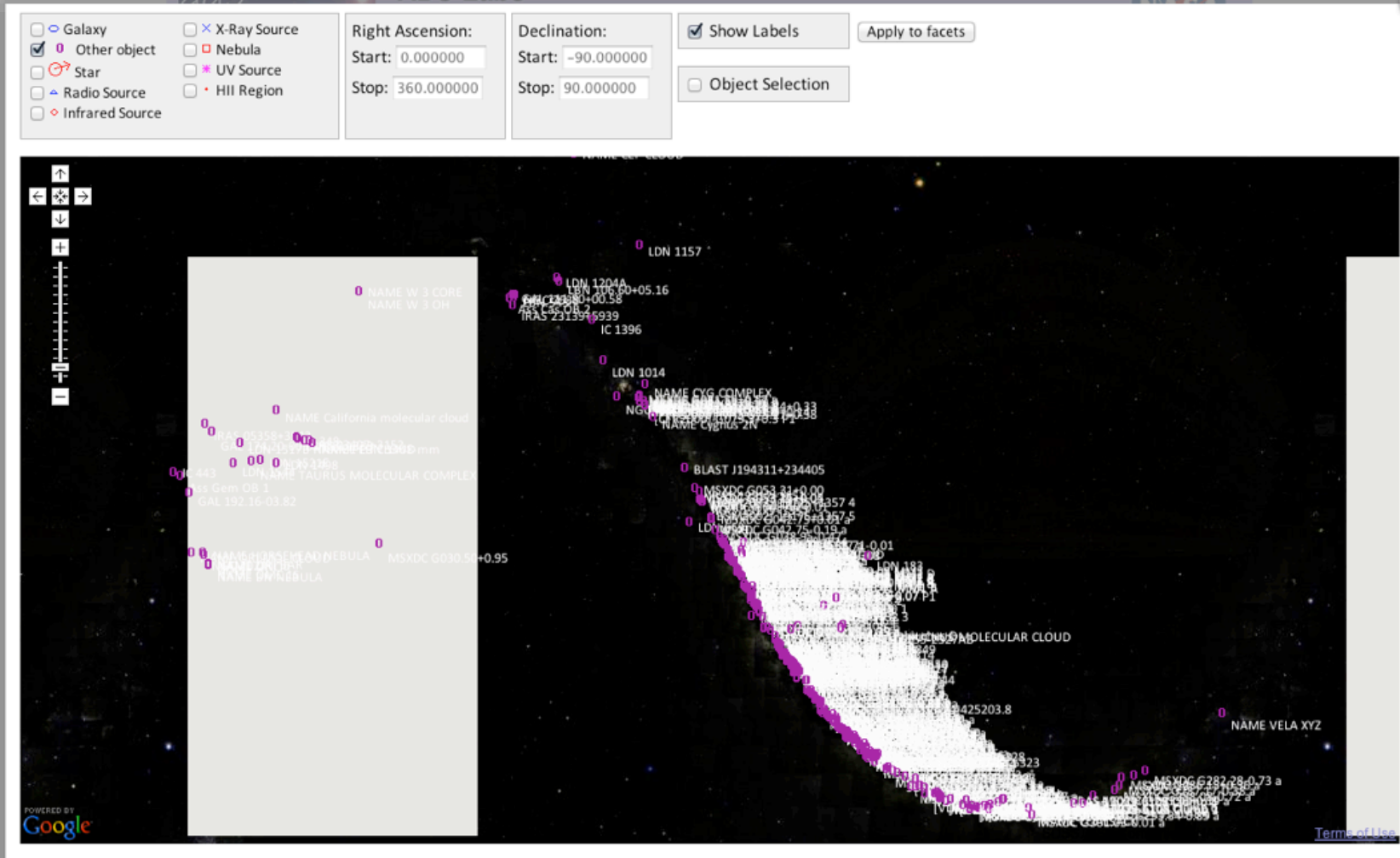


# [SCENE 6]

## ADS, ADS Labs, ADS All-Sky Survey..




**THIS IS NOT GOOD ENOUGH, BUT HINTS AT WHAT IS TO COME!**



Ellingsen, S. *The Astrophysical Journal*, pp. 241-261, Feb 2006

Simbad Objects on Sky Map

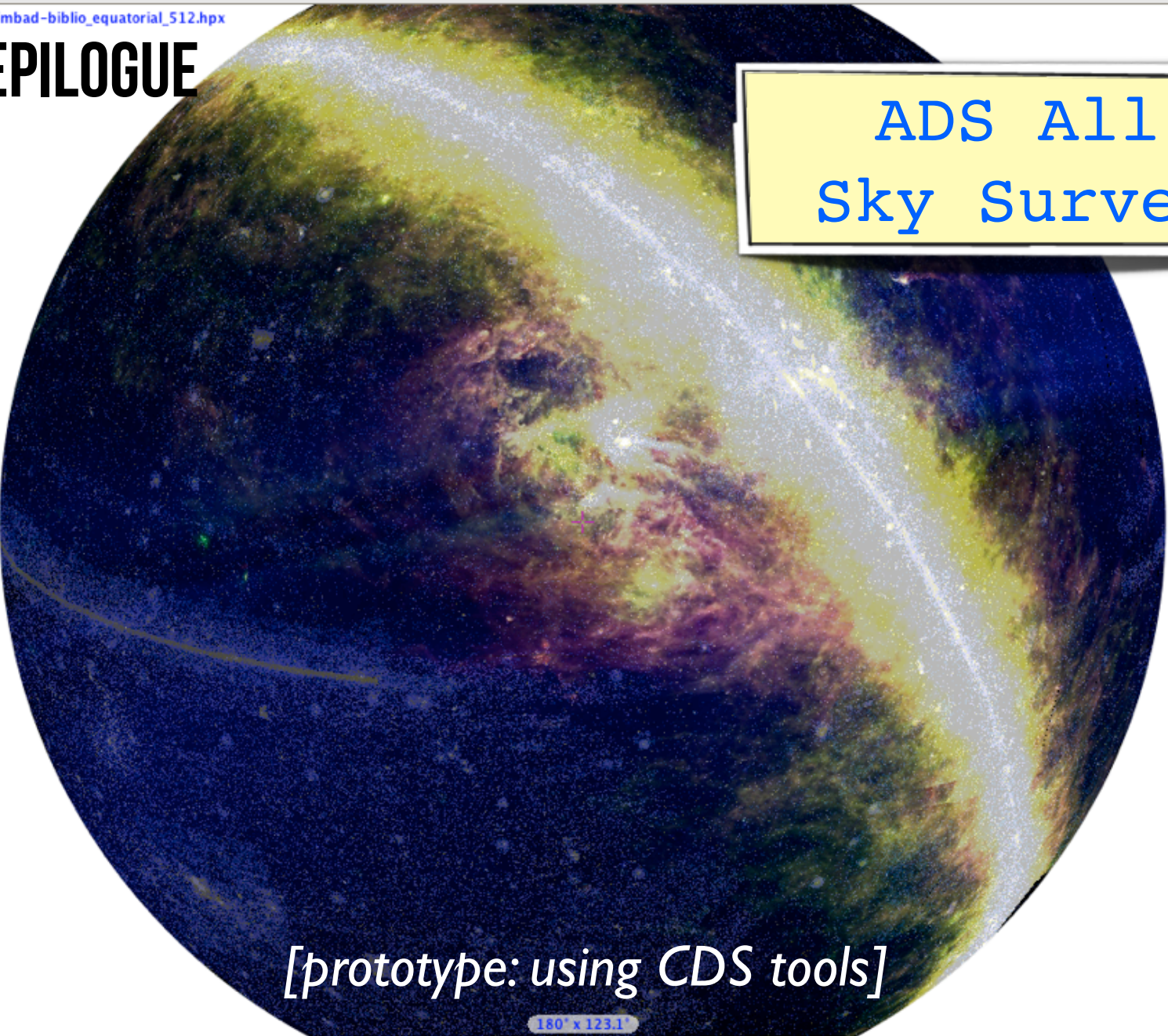
Location  Clear Frame ICRS 

★ Allsky opt ★ Allsky IR ★ DSS ★ Simbad ★ NED ★ PPMX ★ 2MASS

simbad-biblio\_equatorial\_512.hpx

# EPILOGUE

## ADS All Sky Survey



[prototype: using CDS tools]

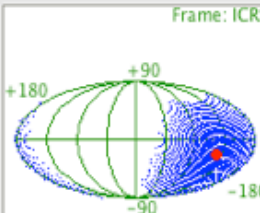
180° x 123.1°

draw  
+ tag  
filter  
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rgb  
assoc  
crop  
cont  
mglss  
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IRIS-IRIS color  
 DSS colored  
 simbad-bibli

om 1/16x


Frame: ICRS

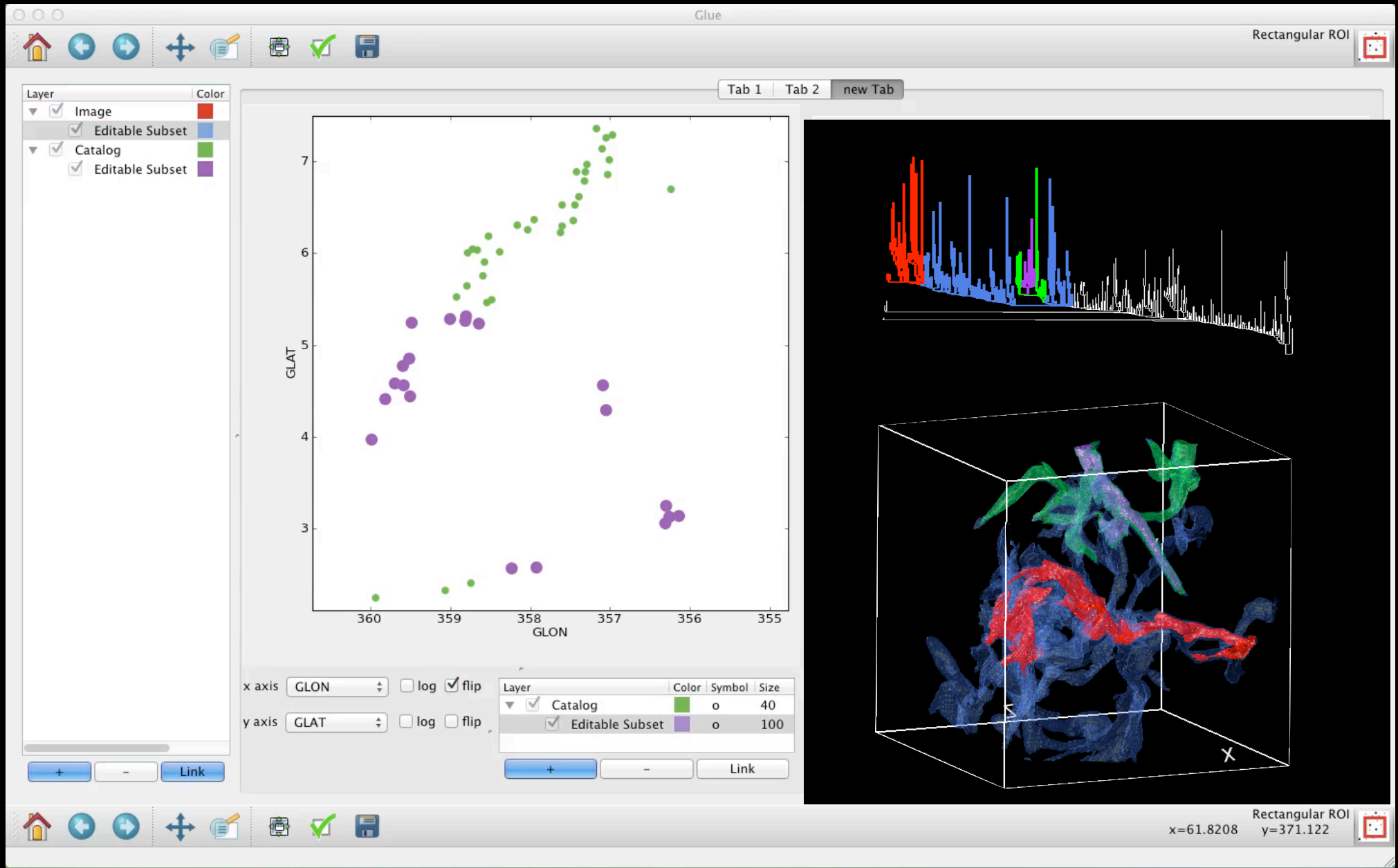


16:08:09.03 -17:03:35.7  
180° x 123.1°

grid north multiview match

Search

0 sel / 0 src 189Mb 



[see presentations/unconferences by Beaumont, Borkin, Robitaille]

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## What is Universe3D.org?

The intention of Universe3D.org is to host links to web content that enable the enhancement of our three-dimensional view of the Universe.

### Recently added Dataset

**SLOAN Digital Sky Survey** [↗](#) The Sloan Digital Sky Survey or SDSS is a major multi-filter imaging and spectroscopic redshift survey using a dedicated 2.5-m wide-angle optical telescope at Apache Point Observatory in New Mexico, United States. The main galaxy sample has a median redshift of  $z = 0.1$ ; there are redshifts for luminous red galaxies as far as  $z = 0.7$ , and for quasars as far as  $z = 5$ ; and the imaging survey has been involved in the detection of quasars beyond a redshift  $z = 6$ .

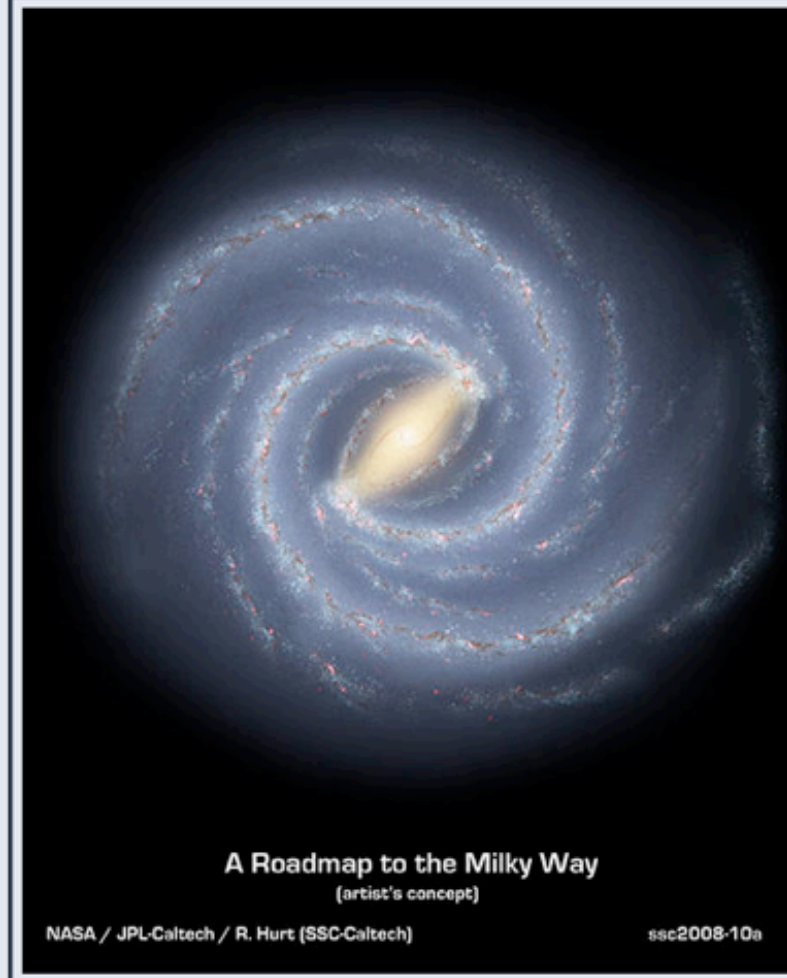
### Astronomy News

- *June 26, 2012:* Astronomers use supercomputer to explore role of dark matter in galaxy formation
- *June 25, 2012:* Moon to pass by Mars tonight
- *June 24, 2012:* Astronomers find planets so close they 'see' each other in night sky
- *June 14, 2012:* Huge Asteroid to fly by Earth
- *June 13, 2012:* Astronomers may have discovered the oldest galaxy in the Universe
- *June 5, 2012:* Last Transit of Venus for the 21st century

### Announcements

- *July 05, 2012:* Website moved to the URL universe3d.org!
  - *June 11, 2012:* Website moved to MediaWiki!
  - *December 5, 2011:* Site established!
- To make good on Alyssa Goodman's promise at the "Milky Way 2011" meeting held in Rome this past September, the site "universe3d.org" has been established. By 2012, it will be populated with links to existing data

### The Milky Way



# EPILOGUE



Microsoft WorldWide Telescope

Explore Guided Tours Search Community Telescope View Settings Milky Way Molecular Clouds f... Sign In

Constellation Lines + Overlays

- Figures
- Boundaries
- Focused Only
- Equatorial Grid
- Ecliptic/Orbits
- Reticle/Crosshairs
- Field of View Indicator

3d Solar System

- Show Stars
- Milky Way
- Cosmos
- Orbits
- Planets
- Asteroids
- Lighting
- Minor Orbits

Observing Location

Name: Algiers, Algeria  
Lat: 45:28:37  
Lng: 09:10:59

View from this location

Observing Time

1636/10/05 03:41:47

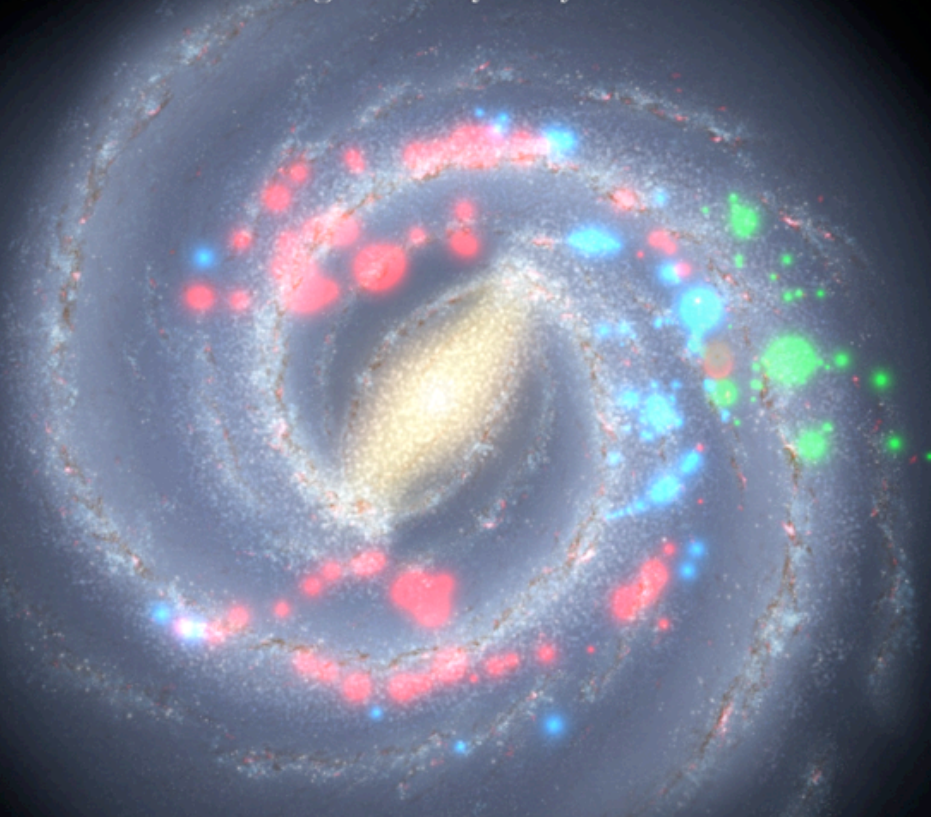
X 10000000

UTC

Now

# UNIVERSE3D.org

Results from Tom Rice's Thesis:  
Preliminary Hierarchical Catalog of Milky Way Plane Molecular Clouds



Look At: SolarSystem Imagery: 3D Solar System View

Tracking: All Context Search Filter: 1 of 2

Planet Size: 145688 ly

Actual Large

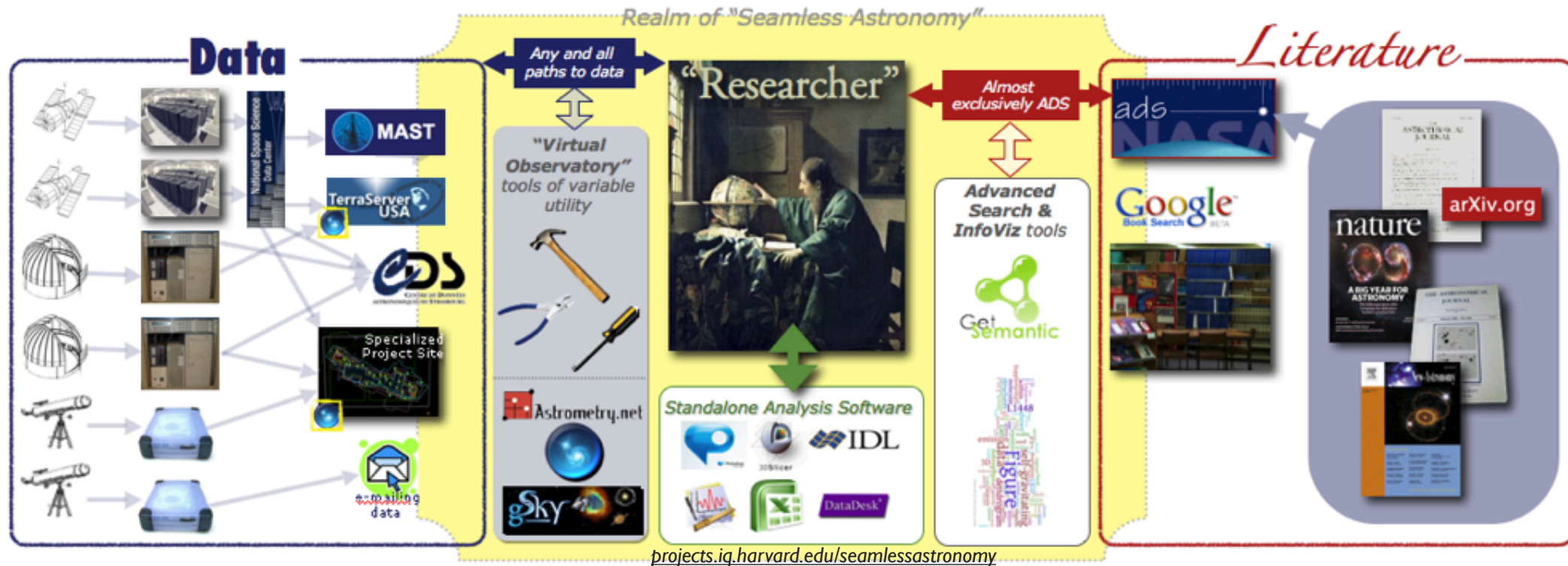
Sun

Lng: -90:48:01  
Lat: -39:51:19

Sun Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto Moon Io Europa

# SEAMLESS ASTRONOMY+

Alyssa A. Goodman, Harvard-Smithsonian Center for Astrophysics



with Alberto Accomazzi, Douglas Burke, Raffaele D'Abrusco, Rahul Davé, Christopher Erdmann, Pepi Fabbiano, Edwin Henneken, Jay Luker, Gus **Muench**, Michael Kurtz, Max Lu, Victoria Mittelbach, Alberto **Pepe**, Arnold Rots, Patricia Udomprasert (Harvard-Smithsonian CfA); Christopher **Baumont** (CfA & U. Hawaii); Michelle **Borkin** (Harvard SEAS); Mercé Crosas (Harvard Institute for Quantitative Social Science); Christine Borgman (UCLA); Thomas **Robitaille** (MPIA); Jonathan Fay & Curtis Wong (Microsoft Research); Alberto Conti (Space Telescope Science Institute)

