

SHARE your data

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CfA, PHILLIPS Auditorium, 11:45 MONDAY 4/2/12



theastrodata.org

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Network**™ PROJECT

&

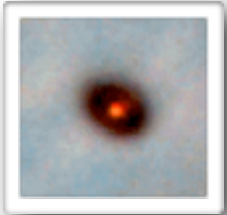
 **SEAMLESS
ASTRONOMY**
Linking scientific data, publications, and communities

Questions? Contact Gus Muench at gmunch@cfa.harvard.edu

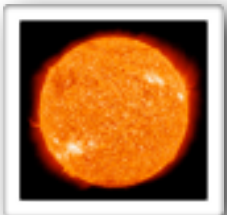
Archetypes in a Dataverse



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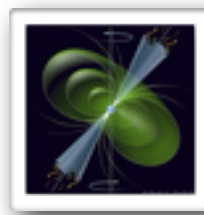
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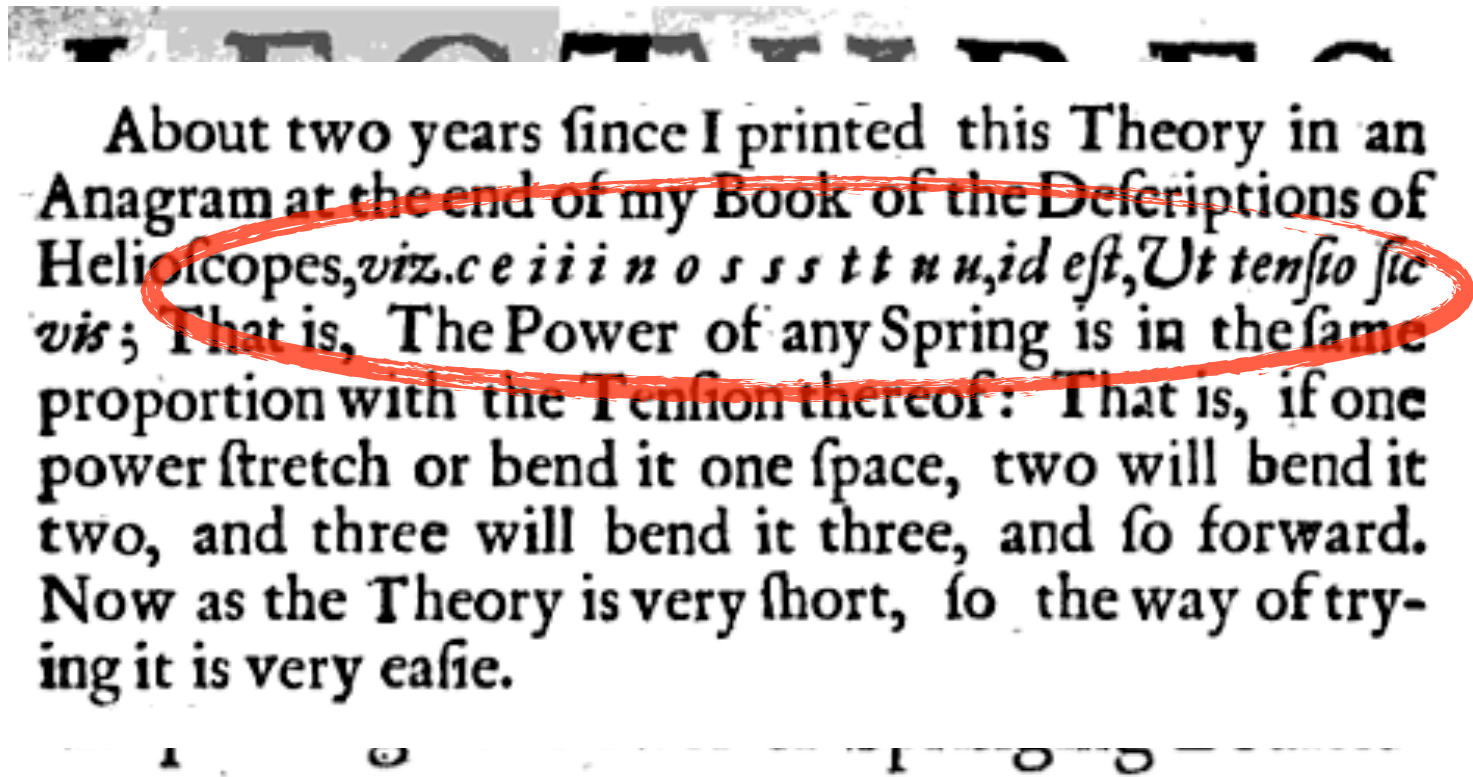


Black Hole You suck down any and all data, with unbridled appetite. Dataverse is *NOT* for you.

The Astronomy Dataverse

or how you can change the world & start publishing YOUR data

1660 Robert Hooke “pre” published as anagram



scientists big thing.data

in the present data live...

The screenshot shows a web browser window with multiple tabs. The active tab displays the article "Hubble Space Telescope Proper Motions and Stellar Dynamics in the Core of the Globular Cluster 47 Tucanae" by Dean E. McLaughlin et al. The page includes a sidebar with navigation links, a table of contents, and a list of online materials. The main content area shows the abstract and the beginning of the introduction. The table of contents lists sections from 1. INTRODUCTION to 7. SUMMARY, with sub-sections for each. The online materials section lists: FITS file, Master frame reference image, Machine-readable table, Table 4, Tar file, and Proper-motion catalog. The abstract describes the use of HST imaging to derive proper motions and U- and V-band magnitudes for 14,366 stars in the core of Globular Cluster 47 Tucanae. The introduction discusses the cluster's kinematics and the use of ACS images to define a list of astrometrically calibrated positions.

THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES

Journal Homepage
Previous
Next
This volume
This issue
This abstract
Search

Online Material
FITS file
Master frame reference image
Machine-readable table
Table 4
Tar file
Proper-motion catalog

Article Contents
Top of Article
1. INTRODUCTION
1.1 Outline of the Paper
2. HST ASTROMETRY AND PHOTOMETRY
2.1 The Available Data and General Approach
2.2 The Master Star List
2.3 Reducing Images from Multiple Epochs
3. VELOCITY SAMPLES
3.1 Proper Motions
3.2 Radial Velocities
4. SPATIAL STRUCTURE AND A MODEL VELOCITY DISTRIBUTION
4.1 Density Profile of Turnoff Stars
4.2 Projected Velocity Distribution
5. THE OBSERVED PROPER-MOTION VELOCITY DISTRIBUTION
5.1 One-dimensional Distributions
5.2 Two-dimensional Distributions
5.3 High-Velocity Stars
6. VELOCITY DISPERSIONS
6.1 Blue Stragglers
6.2 Dispersion as a Function of Stellar Magnitude and Projected Radius
6.3 A Kinematic Distance
6.4 Neglecting Rotation
6.5 Does 47 Tuc Harbor a Central Black Hole?
7. SUMMARY
APPENDIX A
APPENDIX B
REFERENCES
Tables
Figures
Download PDF

Related links
About Related Links
9 Objects in Simbad

The Astrophysical Journal Supplement Series, 166:249-297, 2006 September
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Hubble Space Telescope Proper Motions and Stellar Dynamics in the Core of the Globular Cluster 47 Tucanae¹

Dean E. McLaughlin,¹ Jay Anderson,² Georges Meylan,³ Karl Gebhardt,² Carlton Pryor,⁴ Dante Minniti,² and Sterl Phinney⁵

Received 2006 February 9; accepted 2006 May 5

ABSTRACT

We have used *HST* imaging of the central regions of the globular cluster 47 Tucanae (=NGC 104), taken with the Wide and Field and of the Large Area Camera (WFC3) and ACS instruments between 1995 and 2002, to derive proper motions and *U*- and *V*-band magnitudes for 14,366 stars within 100 arcsec of the cluster center. This represents the largest set of member velocities collected for any globular cluster to date. The cluster's kinematics are characterized by a horizontal branch of the cluster to more than 2.5 mag below the main sequence. In the course of obtaining these kinematic data, we also use a recent set of ACS images to define a list of astrometrically calibrated positions (and *F475W* magnitudes) for nearly 130,000 stars in a larger, $\approx 3' \times 3'$ central area. We describe the procedures in some detail and provide the full position, photometric, and velocity data in the form of downloadable FITS files. We have used the star counts to obtain a new estimate for the position of the cluster center and to define the density profile of the cluster. The cluster's kinematics are characterized by a horizontal branch of the cluster to more than 2.5 mag below the main sequence. In the course of obtaining these kinematic data, we also use a recent set of ACS images to define a list of astrometrically calibrated positions (and *F475W* magnitudes) for nearly 130,000 stars in a larger, $\approx 3' \times 3'$ central area. We describe the procedures in some detail and provide the full position, photometric, and velocity data in the form of downloadable FITS files. We have used the star counts to obtain a new estimate for the position of the cluster center and to define the density profile of the cluster. The cluster's kinematics are characterized by a horizontal branch of the cluster to more than 2.5 mag below the main sequence. In the course of obtaining these kinematic data, we also use a recent set of ACS images to define a list of astrometrically calibrated positions (and *F475W* magnitudes) for nearly 130,000 stars in a larger, $\approx 3' \times 3'$ central area. We describe the procedures in some detail and provide the full position, photometric, and velocity data in the form of downloadable FITS files.

distribution in the inner 5 core radii of the cluster is essentially isotropic, and the detailed dependence of σ_μ on R for $R < 10''$ suggests that heavy remnants contribute only a fraction of a percent to the total cluster mass. Both of these results are earlier, more realistic multimass and anisotropic models of 47 Tuc. (3) Using a sample of 419 line-of-sight velocities of bright giants within $R \leq 105''$, we obtain a kinematic distance to the cluster, $D = 4.0 \pm 0.35$ kpc, formally some 10% greater than recent estimates based on standard color-magnitude diagram fitting, and more consistent with the value implied by fitting dwarf cooling sequence. And (4) by fitting simple models of isotropic, single-mass stellar clusters with central point masses to our observed $\sigma_\mu(R)$ profile, we infer a 1σ upper limit of $M_\bullet \lesssim 1000\text{--}1500 M_\odot$ for any intermediate-mass black hole in 47 Tuc. The best-fit hole mass ranges from zero, if only the kinematics of stars near the main-sequence turnoff mass are modeled, to fainter, less massive stars are also used. We can neither confirm nor refute the hypothesis that 47 Tuc might lie on the $M_\bullet\text{--}\sigma$ relation observed for galaxy bulges.

Subject headings: *astrometry; globular clusters: individual (NGC 104); stellar dynamics*

Online material: FITS file, machine-readable table, tar file

¹ Based on observations made with the NASA/ESA Hubble Space Telescope, obtained at the Space Telescope Science Institute, which is operated by the Association of Universities for Research in Astronomy (AURA), Inc., under NASA contract NAS-5-26555.

Online Material
FITS file

► Master frame reference image

Machine-readable table

► Table 4

Tar file

► Proper-motion catalog



Some tables too

CDS CENTRE DE DONNÉES ASTRONOMIQUES DE STRASBOURG

Simbad Vizier Aladin Catalogs info IDIC Dictionary

new CDS Portal : search by position for available data in CDS services (Simbad, Aladin)

Catalog Selection

Search Criteria

Keywords

- J/ApJS/166/249

Tables

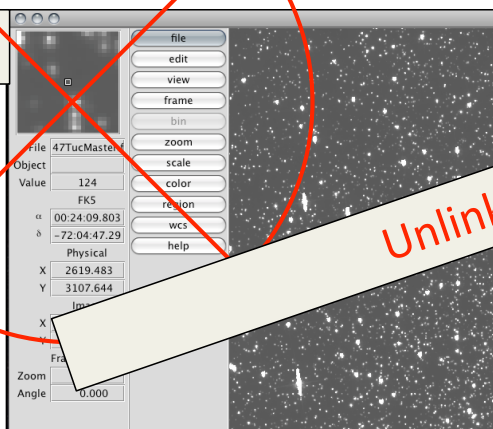
- J/ApJS/166/249
- ..table3
- ..table4
- ..table5

J/ApJS/166/249

Stellar dynamics and proper motion

☐	J/ApJS/166/249/table3	(c) Stars used for astrometric calibration
☐	J/ApJS/166/249/table4	(c) 129733 stars in the Master Frame
☐	J/ApJS/166/249/table5	(c) Proper motions and displacements
☐	Reset All	
☐	ALL	(c)

with a FITS file



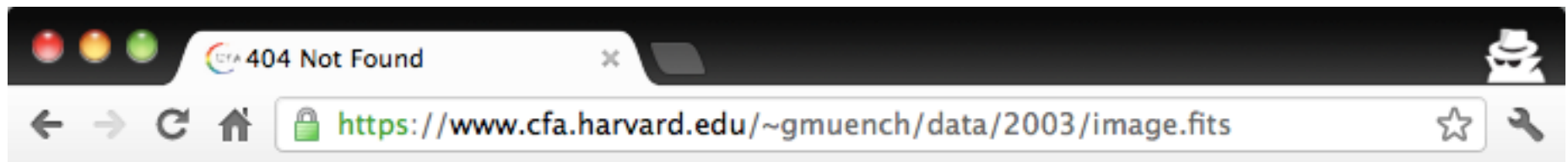
Unlinked Data is LOST data!

24

and some code,

```
1 #
2 # MACRO pmdat REQUIRES ONE COMMAND-LINE ARGUMENT ...
3 #
4 # $1 = ID number of a star in file '___datafile'
5 # in either of two formats: M1111 = an exact ID label in the file
6 # : 1111 = integer part [>0] of a known ID
7 # -- OR --
8 #
9 # $1<=0 or $1=[any string not starting with 'M']
10 # will choose a star at random from the file '___datafile'
11 #
12 #
13 # MACRO pmdat WILL OPTIONALLY TAKE A SECOND ARGUMENT...
14 #
15 # $2 = PRINT [optional]
16 #
17 # if second argument exists and is PRINT
18 # then star data are printed to file with extension '.DATA'
19 #
20 # if second argument is anything else, or does not exist at all,
21 # then star data are echoed to screen instead.
22 #
23 #
24 #
25 # Usage... at the sm prompt, type
```

in the present data live...



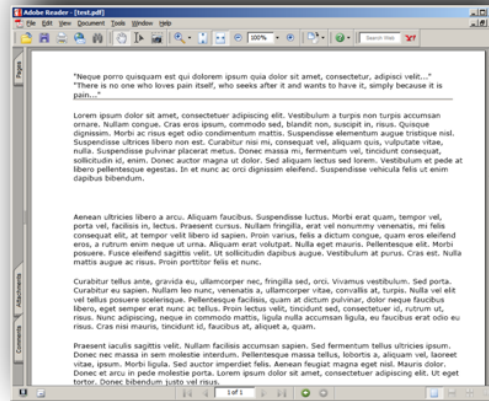
Not Found

The requested URL `/~gmuench/data/2003/image.fits` was not found on this server.

in the present data live...

x0	x1	x2	x3	x4	x5
1	1.06	9.2	151	54.4	1.6
2	0.89	10.3	202	57.9	2.2
3	1.43	15.4	113	53	3.4
4	1.02	11.2	168	56	0.3
5	1.49	8.8	192	51.2	1
6	1.32	13.5	111	60	-2.2
7	1.22	12.2	175	67.6	2.2
8	1.1	9.2	245	57	3.3
9	1.34	13	168	60.4	7.2
10	1.12	12.4	197	53	2.7
11	0.75	7.5	173	51.5	6.5
12	1.13	10.9	178	62	3.7
13	1.15	12.7	199	53.7	6.4
14	1.09	12	96	49.8	1.4
15	0.96	7.6	164	62.2	-0.1
16	1.16	9.9	252	56	9.2
17	0.76	6.4	136	61.9	9
18	1.05	12.6	150	56.7	2.7
19	1.16	11.7	104	54	-2.1
20	1.2	11.8	148	59.9	3.5
21	1.04	8.6	204	61	3.5
22	1.07	9.3	174	54.3	5.9

Data sets

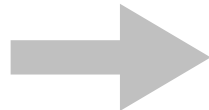


Text



Images

Keep it in my laptop



Hard to share, not safe

Send it to an archive



Author doesn't get enough credit

Post it in my web site



No professional archiving services
(backups, recovering, cataloging,
preservation, etc)

in the future data live...

- Refined data sets are published by YOU in long lived repositories;
- Your data appear in ADS & are “searchable”
- Your data are **reused** and **cited**, giving you credit for that work.



So how do we get
there?



An Open-Source Application for
Publishing, Citing and Discovering Research Data

Created at  **IQSS at Harvard University**

- ☑ Gives **ownership and recognition** to data owner
- ☑ Generates a **persistent data citation**
- ☑ Converts data sets to a **preservable** and verifiable format
- ☑ Distributes data to the **public**, but also supports **restricted** access
- ☑ Indexes all metadata for quick data **discovery**
- ☑ Supports **subsetting and analysis** for (some) data files
- ☑ Can be branded as yours
- ☑ **Inter-operates** with other systems using **standards**

How do Astronomers Use a Dataverse?

or what do you need to publish your data.

we asked a bunch of you some questions

“Mostly FITS”

“thousands of lines, hundreds of columns. hundreds of MBs at most.”

“Terabite-ish.”

"Currently KB, MB
(reduced)"

“No. No Licensing; No obligations.”

“General public”

we asked a bunch of you some questions

“I don't have a website where I store these data. Most of it is in various stages of mess.”

“if we were rich and organized, we would be like Sloan...”

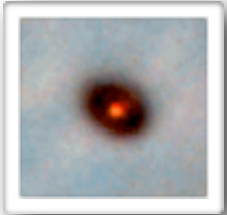
“Visibility from ADS, VizieR, arXiv.... Interface: 1. ability to retrieve the data, 2. simple visualization, 3. VO-interoperability”

“We don't anticipate any fancy interactive data browsing capability. You just download the data and you do anything you like with it.”

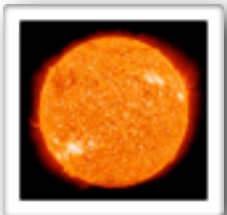
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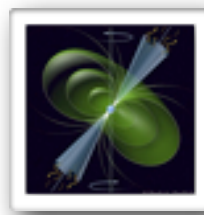
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- Example run through of using the DVN
- Personal Experience from a CfA Astronomer
- Panel Q&A



Data Linking

Table 2 [CITED IN TEXT](#) | [ASCII](#) | [TYPESET IMAGE](#) Go to: [Table 1](#) | [Table 3](#)

WFPC2 and ACS Observations of 47 Tucanae

Data Set	Program ID	N_{obs}	Filter	Date
MEYLANe1...	5912	15	F300W	1995 Oct 25 = 1995.82
MEYLANe2...	6467	16	F300W	1997 Nov 3 = 1997.84
GILLILU1...	8267	28	F336W	1999 Jul 5 = 1999.51
MEYLANe3...	7503	16	F300W	1999 Oct 28 = 1999.82
GILLILU2...	9266	11	F336W	2001 Jul 13 = 2001.53
WFC-MEUR...	9028	20	F475W	2002 Apr 5 = 2002.26
HRC-MEUR...	9028	40	F475W	2002 Apr 5 = 2002.26
HRC-BOHL...	9019	10	F475W	2002 Apr 13 = 2002.28
WFC-KING...	9443	6	F475W	2002 Jul 7 = 2002.52
HRC-KING...	9443	20	F475W	2002 Jul 24 = 2002.56

http://archive.stsci.edu/cgi-bin/proposal_search?mission=hst&id=5912

Someone added these article links to point to archive websites.

Links not present in *arXiv* preprint

Post publication curation? Why?

Author create links to their own data.

2.2.3. Astr

<http://archive.stsci.edu/cgi-bin/mastpreview?mission=hst&dataid=U2VO0101T>

We now have a position for the cluster center in the reference frame, which is based on the distortion-corrected and rotated frame of the first image of GO-9028. In order to transform the master-frame positions into absolute right ascension and declination, we used the image header information from several WFPC2 images ([U2TY0201T](#), [U2VO0101T](#), [U4F40101R](#), and [U5JM120DR](#)) to obtain absolute positions for seven stars—five stars at the center and two stars in the outskirts. These four images were taken at different pointings and orientations, so they should all use different guide stars and give independent estimates of the absolute coordinates.