

Astronomical Journal Writing

Wen Ping CHEN

Astronomical Journal Writing

Syllabus 2024 Spring

Instructor: Professor Wen-Ping Chen

Class Time: Thursday 4 to 6 pm

Classroom: Room 914

Office: S4 Room 906

Office Hours: Please check the posted schedule on my door

We will exercise scientific writing in this course, particularly relevant to literature in astronomy and astrophysics. The class is mixed with lectures, classroom discussions, your presentations, and writing homework assignments. More than manuscripts summarizing your research results ready for journal submission, the training in this course should also benefit your thesis writing, or writing in English in general.

You will (1) be exposed to journals in our discipline, the style, typesetting, targeted readership, etc. --- to analyze a paper, so you can read (and write) one effectively, (2) familiarize yourself with the word processing tools, e.g., LaTeX, overleaf, etc. (3) learn how to do presentation in composing an essay, a poster or in giving a talk, (4) practice sketching a paper plan, with guidelines on choosing a title, to write the abstract, introduction, discussion sections, etc.

This is not a language class, but because we are going to write in English, a certain level of command of English is necessary. In the lectures, we will touch upon some essentials and common pitfalls. My lectures are limited to my experience and knowledge, but your lessons come with how much effort you practice and explore. Expect lots of writing; this is not a sit-back course.

Grading is based on assignments and classroom activity.

Textbook 1: *“Science Research Writing --- For Non-Native Speakers of English”*
by Hilary Glasman-Deal, Imperial College Press

Textbook 2: *“Scientific Writing --- A Reader and Writer’s Guide”* by Jean-Luc
Lebrun, World Scientific

Our NCU library carries the digital version of both.

In this course, we will learn how ...

- **To Read**
(astronomy) journal papers, news, ..., anything
- **To Present**
how to deliver (what you want to show) a talk? A poster?
- **To Listen**
how to be an audience
- **To Write**
a term paper, a conference proceedings paper, a journal paper

This is a workshop course in which you will learn about presenting your research results in a poster, a seminar, or in a journal paper.

We will review the journals in astronomy and astrophysics, and discuss the practicality of submitting a paper to these journals, first by reading some of the papers already published (the good and the bad), then by writing a short one of your own.

You will be exposed to a variety of tools to help compose an essay, and develop the skills to come up with a writing plan, starting from the paper “skeleton” and branching out to sections, subsections, paragraphs, to sentences.

This is not a language course, therefore a good command of language (English) is a prerequisite. I will lecture. But you should do much of the work by excessive reading and writing.

- There is no point sitting in the class. You do not learn (much) by listening.
- You improve by doing, that is, by writing.
- Scientific writing is English writing.
- If you cannot write well in your own language, you most likely cannot write well in English.
(Try to compose an email to inform others about this class.)
- Nothing trumps good scientific results to write about.
- Scientific writing is easier, because of the often restrict format (and language). *Easier than what?*
- Grammatical and spelling errors, stylish glitches, vs styles (author, nationality/culture, publisher ... *Be a seasoned writer*

- How to be an effective reader and an audience
- Good practices to make a presentation
- Journals in astronomy and astrophysics
- Paper structure: the writing plan
 - + Title and abstract
 - + Section and subsection headings
 - + Introduction
 - + Figures and tables
 - + Conclusions

J E A N - L U C L E B R U N

SCIENTIFIC WRITING

A READER AND
WRITER'S GUIDE



SCIENTIFIC WRITING 2.0

**A Reader and
Writer's Guide**



Lebrun Jean-Luc

The
Expanded Edition
with Writing
Diagnosis Tool on
DVD for Mac
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All4UST



電子書

電子書查詢

Lebrun



Science Research Writing

For Non-Native Speakers of English

Hilary Glasman-Deal



Imperial College Press

請輸入關鍵字(keyword search) :

查詢

1.Science research writing for non-native speakers of English [electronic resource] / Hil...

書名 **Science research writing for non-native speakers of English [electronic resource] / Hilary Glasman-Deal.**

作者 **[Glasman-Deal, Hilary.](#)**

出版項 London : Imperial College Press ;
Singapore : Distributed by World Scientific Pub. Co., c2010.

評級 **評等** ★★★★★



-QRcode(書名,館藏地等)-

連接至

[click for full text\(World Scientific\)](#)

Unit 1 How to Write an Introduction

1.1 Structure

Until now, much of your science writing has focused on writing reports in which you simply described what you did and what you found. Although this will help you write the central ‘report’ sections (Methodology and Results) of a research paper or thesis, it doesn’t prepare you for writing an Introduction to a full-length research article; this is a new task that faces you once you move on to research writing.

In practice, you will find that you need to be certain about what you have done and what you have found in order to write the Introduction, and so the best time to write it will be after you have written, or at least drafted, the report sections. However, in this book, the structure of a research article is presented in the order in which it appears in a paper/thesis so that you can trace the connections between each part and see the sequence in which information is presented to the reader.

You may want to start your Introduction by describing the problem you are trying to solve or the aim of your work but as you will see

The Introduction section is often difficult to write.

Tools of the Trade

- **SIMBAD** (what does this word mean?)
--- <http://simbad.u-strasbg.fr/simbad/>
information regarding a celestial object: observations, literature
- **VizieR** (what does this word mean?)
--- <https://vizier.u-strasbg.fr/viz-bin/VizieR>
published astronomical catalogues and data
- **ADS** Abstract service
--- <https://ui.adsabs.harvard.edu/>
online astronomy and physics literature



SIMBAD Astronomical Database - CDS (Strasbourg)

What is SIMBAD ?

Queries
basic search
by identifier
by coordinates
by criteria
reference query
scripts
TAP queries
options
Display all user annotations

Documentation
User's guide
Query by urls
Nomenclature Dictionary
Object types
List of journals
Measurement description
Spectral type coding
User annotations documentation
Acknowledgment

Information
Presentation
Image thumbnails
BETA - Mobile version
SimWatch
Release:
SIMBAD4 1.7 - May-2018
Release history

Content
The SIMBAD astronomical database provides basic data, cross-identifications, bibliography and measurements for astronomical objects outside the solar system.
SIMBAD can be queried by object name, coordinates and various criteria. Lists of objects and scripts can be submitted.
Links to some other on-line services are also provided.

Basic search
<input type="text"/>
<i>identifier, coordinates (radius=10 arcmin), or bibcode</i>
SIMBAD search clear help
Install the Simbad basic search in your tool bar

Acknowledgment
If the Simbad database was helpful for your research work,

Statistics
Simbad contains on <i>2020.03.01</i>

VizieR

[VizieR home](#) · [Photometry viewer](#) · [Query VizieR using TAP](#) · [X-match tables](#) · [Query images/spectra](#)

Search Criteria

Preferences

max: 50

HTML Table

 All columns

▶ Compute

Mirrors

CDS, France

Find catalogs among 19481 available

Clear Find...Expand search

? *Catalog, author's name,
word(s) from title, description, etc.
e.g.: AGN, Veron, I/239, or bibtodes...*

- ▶ Search for catalogs by column descriptions (UCD) ?
- ▶ Search for catalogs containing additional data

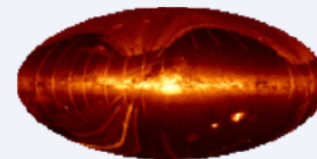
Search by Position across 21083 tables

Target Name (resolved by [Sesame](#)) or Position:Clear J2000 2 arcmin Go!

Target dimension:

 Radius Box size

Wavelength	Mission	Astronomy
Radio	AKARI	Abundances
Millimeter	ANS	Ages
IR	ASCA	AGN
optical	BeppoSAX	Associations
UV	CGRO	Asteroseismology
EUV	Chandra	Atomic_Data
X-ray	COBE	Binaries:cataclysmic



Find Catalogs

[More about VizieR](#)

Tools related to VizieR

- [CDS Portal](#) : Access CDS data including VizieR, Simbad and Aladin using the CDS portal
- [Spectra, images in VizieR](#) : Search Spectra, images in VizieR
- [Photometry viewer](#) : Plot photometry (sed) including all VizieR
- [TAP VizieR](#) : query VizieR using ADQL (a SQL extension dedicated for astronomy)
- [CDS cross-match service](#) : fast cross-identification between any 2 tables, including VizieR catalogues, SIMBAD

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astrophysics data system

[Classic Form](#)[Modern Form](#)[Paper Form](#)QUICK FIELD: [Author](#) [First Author](#) [Abstract](#) [All Search Terms](#)

author	author:"huchra, john"	citations	citations(author:"huchra, j") ?
first author	author:"^huchra, john"	references	references(author:"huchra, j") ?
abstract + title	abs:"dark energy"	reviews	reviews("gamma-ray bursts") ?
year	year:2000	refereed	property:refereed ?
year range	year:2000-2005	astronomy	database:astronomy ?
full text	full:"gravity waves"	OR	abs:(planet OR star) ?
publication	bibstem:ApJ ?		

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QUICK FIELD: Author First Author Abstract Year Fulltext All Search Terms

Start New Search

author:"^Einstein, Albert" year:1910-1920

Your search returned 85 results

Date

Export Explore

- AUTHORS**
 - Einstein, A 85
 - de Haas, W 3
 - Hopf, L 2
 - Asher, L 1
 - Coehn, A 1

- COLLECTIONS**
 - astronomy 81
 - physics 37
 - general 1

- REFEREED**
 - refereed 64
 - non-refereed 21

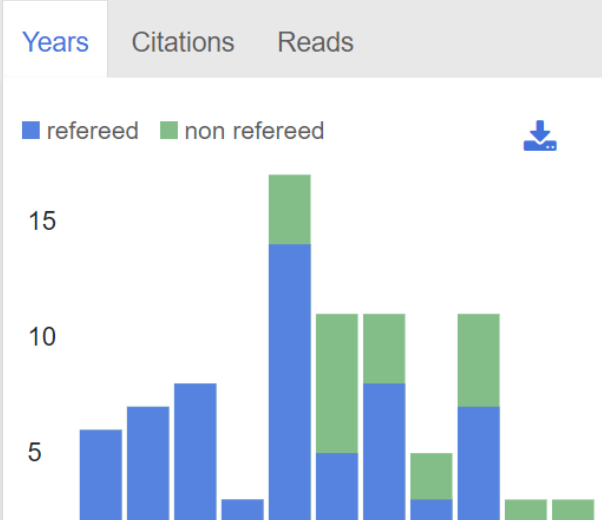
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1	1920NW.....8.1010E	1920/12	cited: 5			
	Antwort auf vorstehende Betrachtung Einstein, A.					
2	1920Sci....51....8E	1920/01				
	Time, Space, and Gravitation Einstein, Albert					
3	1920SPAW.....380E	1920				
	Schallausbreitung in teilweise dissoziierten Gasen Einstein, Albert					
4	1919NW.....7..776E	1919/10	cited: 2			
	Prüfung der allgemeinen Relativitätstheorie Einstein, A.					
5	1919SPAW.....433E	1919	cited: 2			
	Bemerkung über periodische Schwankungen der Mondlänge welche bisher nach der					

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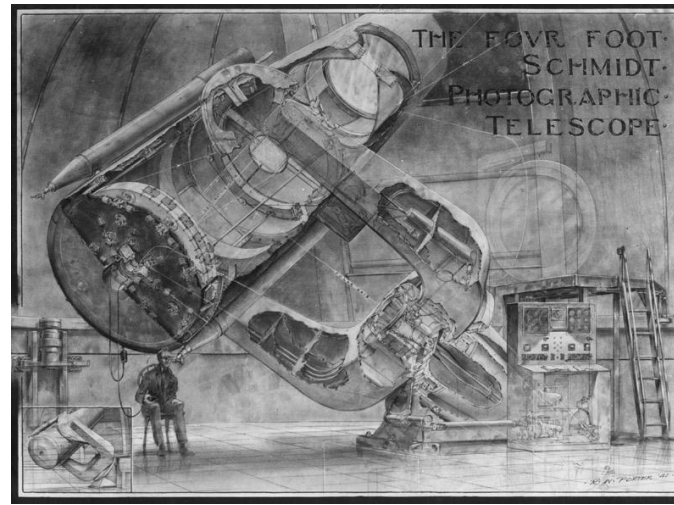


Tools of the Trade (*cont.*)

- **DSS** (THE digitized sky survey)
 - at ESO
 - at STScI/MAST
 - at IRSA
 - at CADC
 - image depository*
- Dictionary/Thesaurus (your own favorable ones)
 - <https://www.dictionary.com/>
 - <https://www.thesaurus.com/>

Palomar Observatory Sky Survey (POSS)

- From 1949, Palomar Observatory 48 inch Schmidt Telescope
→ mapping of the entire visible sky
- Funded by National Geographic Society and Caltech
- Using 14 inch glass plates, each of 6 deg on a side on the sky;
every patch of sky taken by blue (Kodak 103a-0) and red
(Kodak 103a-E) sensitive emulsion
- 1958 completed north of -30 deg latitude; limiting 22 mag
- Followed by survey in the south; second generation
- All plates digitized by various institutes, e.g., Digitized Sky Survey (DSS)





2015/03/13

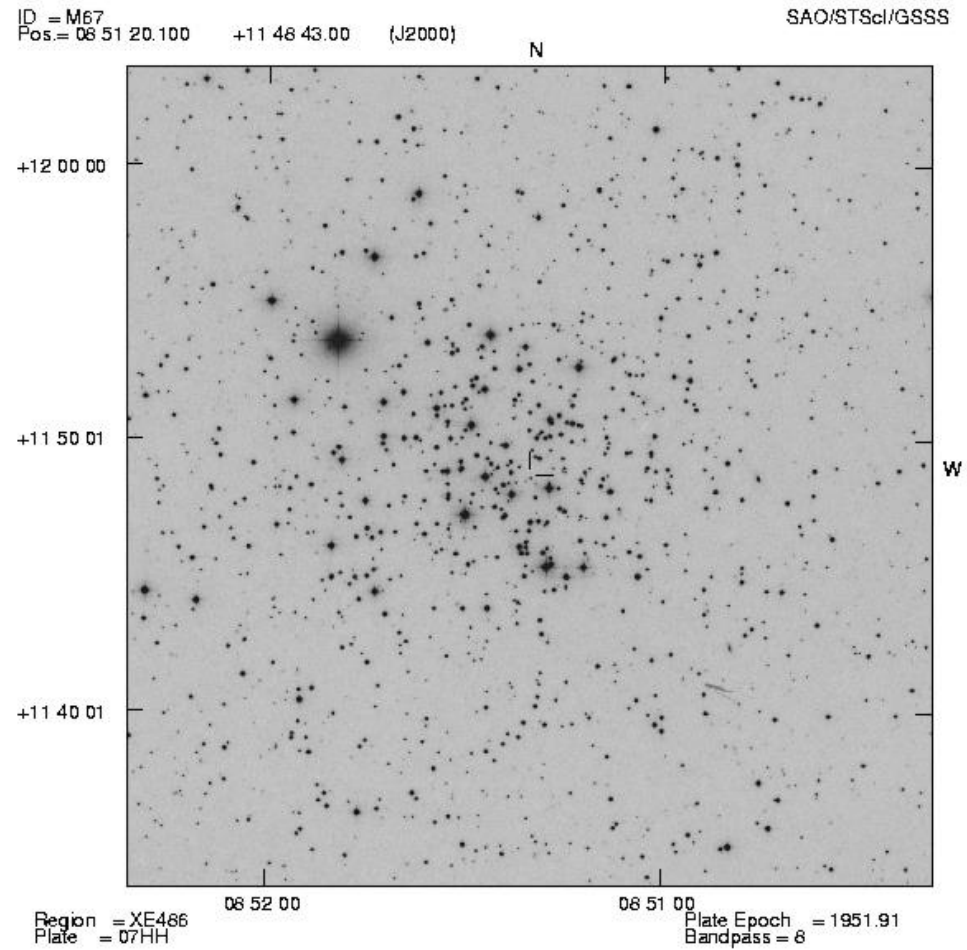
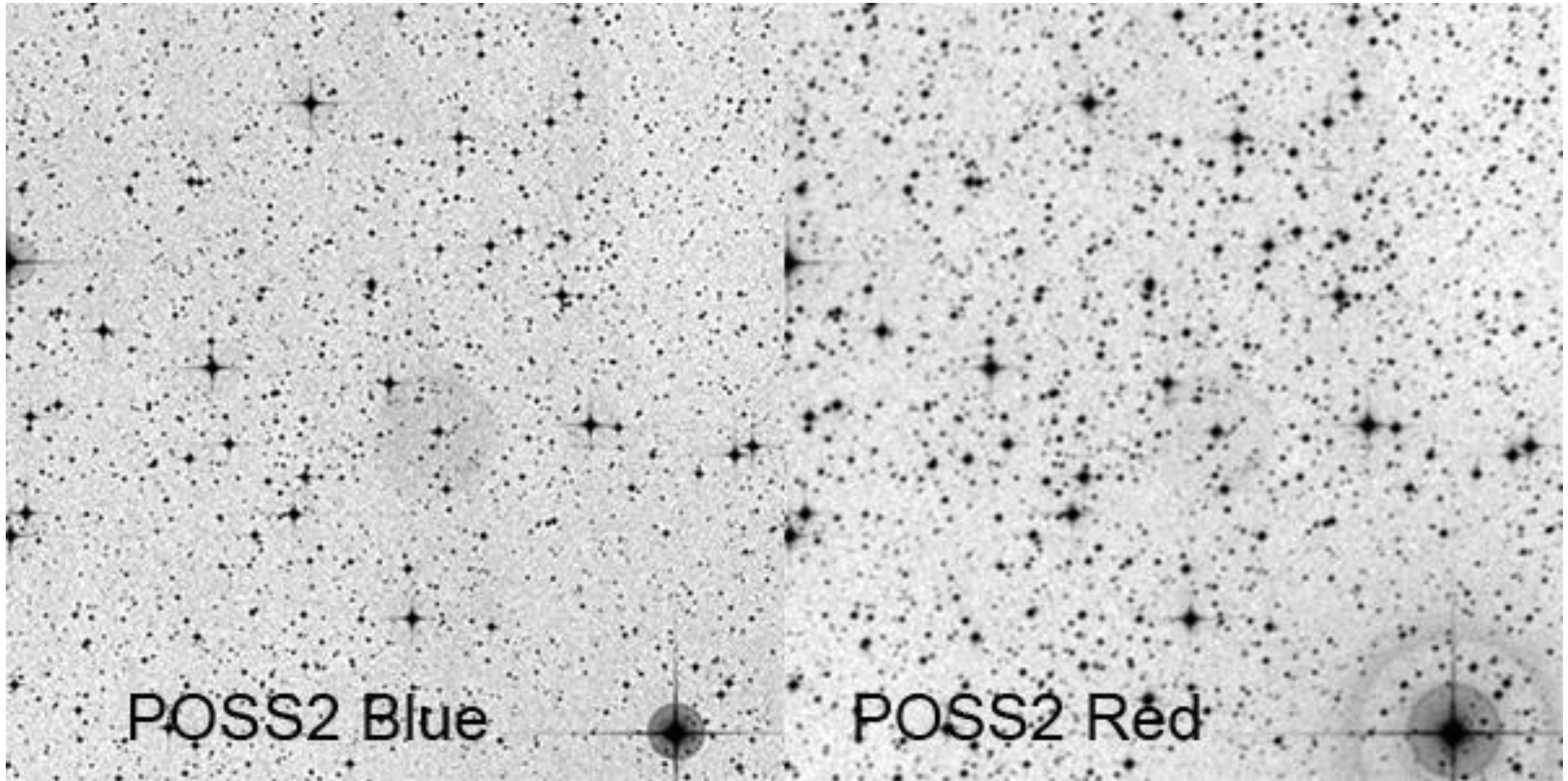


Plate image with overlaid information. Here M67 is shown with the image taken from the POSS, FOV=30'.



<http://www.astrodonimaging.com/gallery/display.cfm?imgID=279>

https://archive.stsci.edu/cgi-bin/dss_form

The STScI Digitized Sky Survey

NOTE: To obtain target coordinates for **HST Phase 2 proposals**, select the HST Phase 2 (GSC2) survey option.

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[Get an Object's Coordinates](#)

Object name
Get coordinates from [SIMBAD](#) [NED](#)

[Retrieve an Image](#)

[Retrieve from](#)

POSS2/UKSTU Red ▲
POSS2/UKSTU Blue
POSS2/UKSTU IR
POSS1 Red
POSS1 Blue
Quick-V
HST Phase 2 (GSC2) ▼

[\(detailed information about the Surveys\)](#)

[RA](#) [Dec](#) J2000 ▼

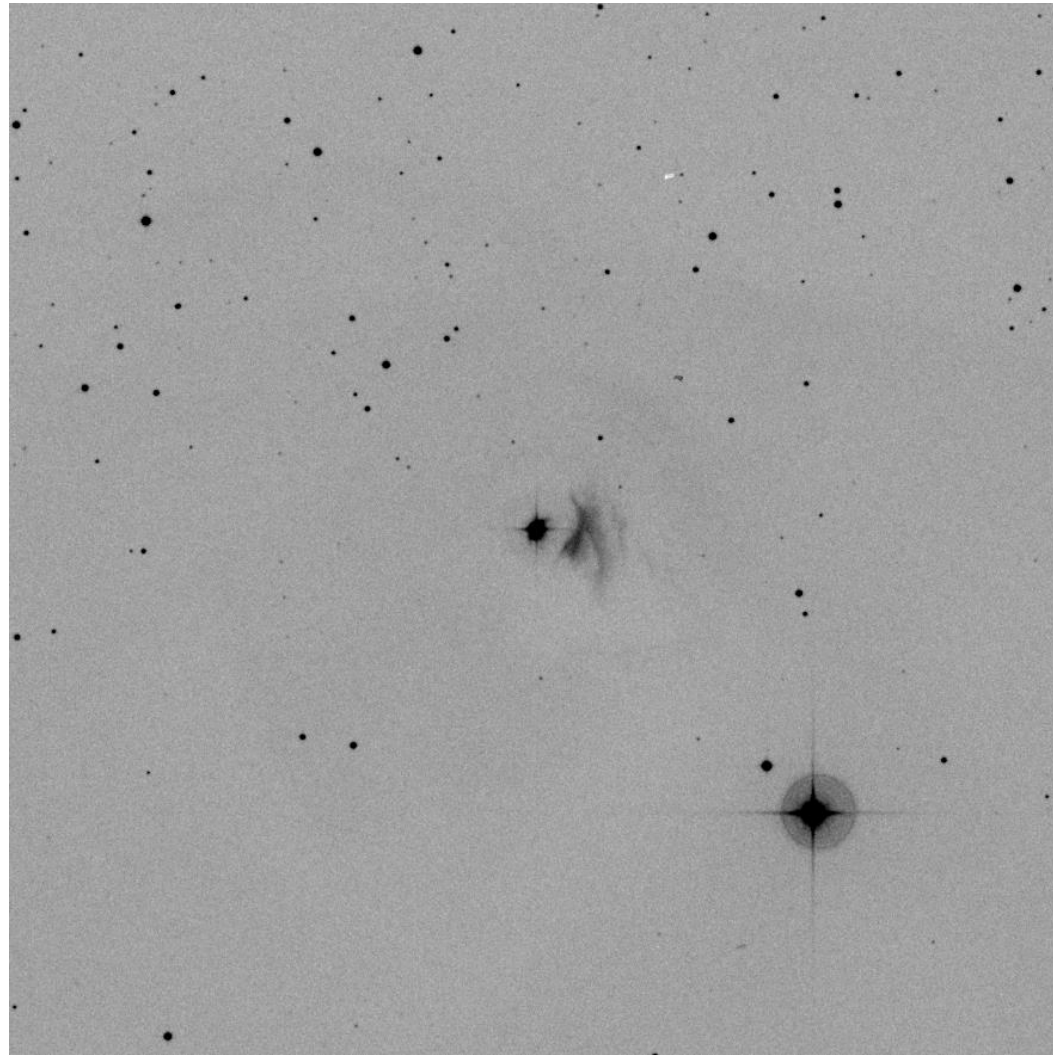
[Height](#) (max: 60.0) [Width](#) (max: 60.0) arcminutes

[File format](#) ▼ [Compression \(FITS only\)](#) ▼

[Save file to disk \(instead of displaying\)](#)

[HST Field of View Overlay \(1st generation GIF only\):](#) ▼

[Roll angle \(V3\):](#)



T Tauri

(coordinates resolved by
Simbad by MAST)

POSS 2 blue

FOV 30'

FITS

ds9 → png image

What is *SIMBAD*?

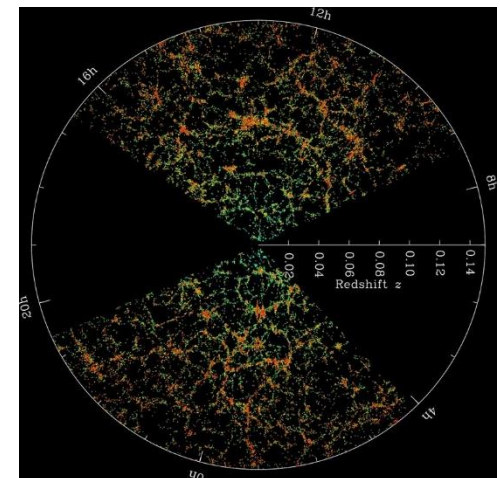
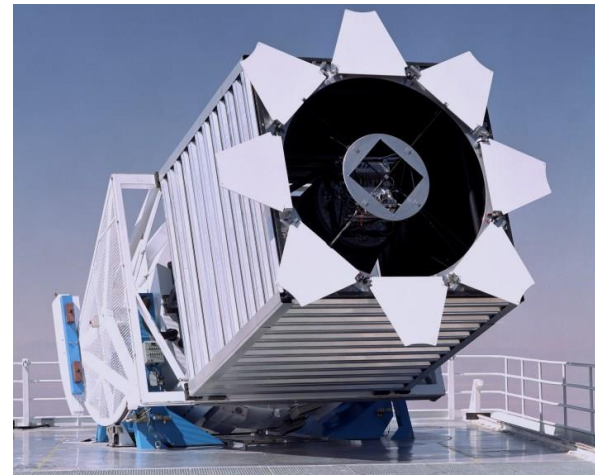
What information can be found for T Tau?

Sloan Digital Sky Survey (SDSS)



- Multi-color imaging and spectroscopic redshift survey
- Apache Point Observatory 2.5 m telescope in New Mexico, USA; named after Alfred P. Sloan Foundation.
- SDSS I (2000-2005); II (2005-2008); III (2008-2014)
- DR12 (2014 July) (images, O/IR spectra, catalog data)
- SDSS IV (2014-2010)

<http://www.sdss.org/>



Elsevier: Author guideline

<https://www.elsevier.com/connect/author-guidelines-and-submission-process>

AAS journals: Author guide

<https://journals.aas.org/author-resources/>

Writing tips

- Show, don't just tell.
- Use action verbs; go easy on the adjectives
- Choose active voice
- Quotes should sound human
- Avoid clichés
- Say it simply
- Define technical terms
- Eliminate words that do not add meaning

Steps to organizing your manuscript

1. Prepare the figures and tables.
2. Write the Methods.
3. Write up the Results.
4. Write the Discussion.

Finalize the Results and Discussion before writing the introduction. This is because, if the discussion is insufficient, how can you objectively demonstrate the scientific significance of your work in the introduction?

5. Write a clear Conclusion.
6. Write a compelling Introduction.
7. Write the Abstract.
8. Compose a concise and descriptive Title.
9. Select Keywords for indexing.
10. Write the Acknowledgements.
11. Write up the References.

Exercise

Write one paragraph to report the following hypothetical situation.

- ✓ **Who:** FU Orionis (position, any other information?)
- ✓ **What:** Brighter than the nominal literature value by 1.2 mag in V, and 0.8 mag in B; remained the same state during the rest of the observing session
- ✓ **When:** observed September 17, 2021, UTC16:31 to 19:45, then clouded out for the night
- ✓ **Where:** LOT, (detector?)

(No need to interpret the result.)

**long term development!****Patrons needed: 28**[\[Previous | Next \]](#)

Apparent Outburst of Comet C/2014 UN271 (Bernardinelli-Bernstein)

ATel #14917; *Michael S. P. Kelley (U. Maryland), Tim Lister (Las Cumbres Observatory), Carrie E. Holt (U. Maryland), on behalf of the LCO Outbursting Objects*

Key Project

on 14 Sep 2021; 17:46 UT

Credential Certification: *Tim Lister (tlister@lco.global)*

Subjects: Optical, Comet

[Tweet](#)

We report an apparent outburst of comet C/2014 UN271 (Bernardinelli-Bernstein), as seen in Las Cumbres Observatory 1-m telescope data. Following our initial observations (Kokotanekova et al. 2021, ATEL #14733), the comet had faded in brightness to $r=19.57\pm 0.04$ mag, measured within a 4" radius aperture on 2021 Sep 09.103 UTC and calibrated to the PS1 magnitude system. In our next data taken 2021 Sep 09.924 UTC the comet had brightened to $r=18.92\pm 0.04$ mag, a difference of -0.65 ± 0.06 mag. No background source is visible at the comet's coordinates in Digitized Sky Survey images. The brightening is confirmed in subsequent data taken 2021 Sep 11.335 UTC, $r=19.02\pm 0.04$ mag. On Sep 09, the comet was 19.89 au from the Sun, 19.44 au from the Earth, and at a phase angle of 2.6 deg.

This work makes use of observations from the Las Cumbres Observatory global telescope network.

Related

14917 [Apparent Outburst of Comet C/2014 UN271 \(Bernardinelli-Bernstein\)](#)

14759 [Comet C/2014 UN271 \(Bernardinelli-Bernstein\) exhibited activity at 23.8 au](#)

14733 [Newly discovered object 2014 UN271 observed as active at 20.18 au](#)

Information

1. FU Orionis is at R.A.=05^h 45^m 22.37^s, Decl.=+09°04'12.3" (J2000).
2. It is a T Tauri star, the prototype of the FU Ori type (eruptive young variable).
3. It has a nominal brightness of 9.60 mag at V and 10.72 mag at B.
(About the target; from SIMBAD)
 1. The star was measured to be brighter by 1.2 mag in V, and 0.8 mag in B, and remained the same during the observing session.
 2. The observations then were stopped because of bad weather.
(About the event)
 1. The observations were taken by the LOT.

Original submission

FU Orionis (R.A.=05^h 45^m 22.37^s, Decl.=+09°04'12.3", J2000), the prototypical FU Ori class of T Tauri stars, found to be brighter by 1.2 mag at V band and 0.8 mag at B band from its nominal brightness of $m_V = 9.60$ mag and $m_B = 10.72$. The observation is undertaken from 2021 September 17 UTC 16:31 to 19:45 with the Lulin One-meter Telescope, equipped with an ANDOR iKon-L 936 TE-cooling CCD camera, which is 2048×2048 pixels with a pixel size of $13.5 \mu\text{m}$. It remained the same brightness throughout the observing session until it is terminated by clouds.

Corrected version

FU Orionis (R.A.=05^h 45^m 22.37^s, Decl.=+09°04'12.3", J2000), the prototypical FU Ori class of T Tauri stars, foud to brighter by 1.2 mag at V band and 0.8 mag at B band ~~from~~ its nominal brightness of $m_V = 9.60$ mag and $m_B = 10.72$. The observation is undertaken from 2020 March 4 UTC16:31 to 19:45 with the Lulin One-meter Telescope, equipped with an ANDOR iKon-L 936 TE-cooling CCD camera, which 2048 × 2048 pixels with a pixel size of 13.5 μm. It remained the same brightness throughout the observing session until it is teminated by clouds.

FU Orionis (R.A.=05^h 45^m 22.37^s, Decl.=+09°04'12.3", J2000), the prototypical FU Ori class of T Tauri stars, was found to be brighter by 1.2 mag at V band and 0.8 mag at B band than its nominal brightness of $m_V = 9.60$ mag and $m_B = 10.72$. The observations were carried out from 2021 September 17 UTC16:31 to 19:45 with the Lulin One-meter Telescope, equipped with an ANDOR iKon-L 936 TE-cooling CCD camera, which has 2048×2048 pixels with a pixel size of $13.5 \mu\text{m}$. The star remained the same brightness throughout the observing session.

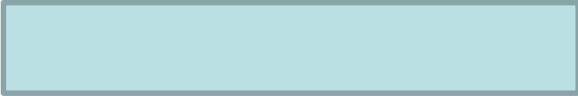
FU Orionis, the prototypical abrupt young stars (FUors), was found to be brighter by 1.2 mag at V band and 0.8 mag at B band than its nominal brightness of $m_V = 9.60$ mag and $m_B = 10.72$ (SIMBAD). The observations were carried out, with the LOT, from 2021 September 17 UTC16:31 to 19:45, during which the star remained the same brightness until the run was clouded out.

Homework I

We observed FU Orionis (FU Ori) by Lulin One-meter Telescope (LOT) on September 17, 2021 UTC 16:31 to 19:45. FU Ori is an archetypically FUor star located in the Lambda-Orion star formation region (Labdon et al. 2021), with a heliocentric[?] of ~ 397.81 pc (Gaia Collaboration et al. 2022), at the position of $(\alpha_{J2000}, \delta_{J2000}) = (05\ 45\ 22.3647842544, +09\ 04\ 12.291320064)$ (SIMBAD). FU Ori is a young stellar object that manifests rapid change in brightness and undergoes irregular accretion events. In our observed session, we found the brightness of FU Ori increased by 1.2 magnitude in V band, and 0.8 magnitude in B band, which is brighter than previously measurement in literature. !! what

*What, by whom, when, how,
where*

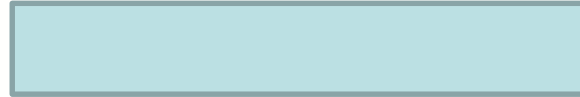
To: Professor Dr. Chen, Wen-Ping


Subject: An unusual luminosity hike in FU Orionis

Date: March 6, 2024

FU Orionis is a pre-main sequence star, which is about 1,500 light years away from Earth in the Orion constellation. After the initial burst in 1936, the star's extreme brightness began diminishing with time. A rapid brilliance of the star was observed on September 17, 2021, UTC 16:31 to 19:45, with the help of the Lulin Observatory Telescope (LOT). An escalation of 1.2 mag in V and 0.8 mag in B bands was detected while comparing to the past literature. Further studies are yet to be done for more accurate data. 3!

Scientific Writing Exercise 1



March 2024

A remarkable astronomical event was observed on September 17, 2021, when FU Orionis, a class of T Tauri star, exhibited a surprising peak in luminosity, shining 1.2 magnitudes brighter in V and 0.8 magnitudes brighter in B ~~bands~~ than previously documented. Observed by the **LOT Observatory**, the event unfolded from UTC 16:31 to 19:45, with FU Orionis maintaining its high level of luminosity throughout the observational period until clouded out. This anomaly prompts a reevaluation of our understanding of FU Orionis variables and highlights the complexities inherent in stellar evolution.

at
by LOT

]!

Assignment-2

11 March 2024

1 Astronomy Journals

Which ten?

Of the ten Astronomy Journals I have surveyed, five of them have associated publications, which may include letters, supplements, or companion series. The above-mentioned journals are:

1. The Astrophysical Journal Supplement Series (ApJS)
2. Astronomy & Astrophysics Supplement Series (A&A Supplement)
3. Publications of the Astronomical Society of the Pacific (PASP)
4. Monthly Notices of the Royal Astronomical Society (MNRAS)
5. Living Reviews in Solar Physics

2 Core Journals

The “core journals” are such publications which are considered as publishing the most relevant findings, and central concepts and are highly respected in the particular discipline. They are widely read by researchers and used for further development in the field. Some of the core journals in Astronomy and Astrophysics are given below:

1) **The Astronomy and Astrophysics Review** is a core journal published quarterly by Springer-Verlag GmbH Germany, part of Springer Nature. The journal is published in English language.

2) **Living Reviews in Solar Physics** is a peer-reviewed scientific journal published in English by Springer Science+Business Media. It doesn't have a fixed frequency for publication.

3) **Nature Astronomy** is a monthly journal published by Nature Portfolio in the English language.

4) **Publications of the Astronomical Society of the Pacific (PASP)** is a monthly journal published in English by the Astronomical Society of the Pacific.

5) **The Astronomical Journal (AJ)** is a monthly journal published by IOP for the American Astronomical Society. It is published in the English language.

Mind the spelling, grammar, clarity ...

Yes, we all have problems/questions/issues ... but ...

What are your (favorite) tools ... *spellchecker, Word, Grammarly*

This is what I used at all times, other than a hard copy

<https://www.dictionary.com/> infrared-excess, red shift, x rays

Also useful (I use even more frequently) is

<https://www.thesaurus.com/>

Wikipedia (wiki+encyclopedia) is OK if properly used as a portal to further knowledge.



“wiki wiki” shuttle at Honolulu airport



“tuck-tuck” in India



“tuk-tuk” in Thailand