How to give a talk

Why? What? To whom? When? Where? (the 5Ws)

- Targeted audience

  To astronomers? School kids? General public?
  For journal club? Colloquium? In English?

- Location

  In a small discussion room? In a (dark) lecture hall? Stadium?

- Use proper media

  PowerPoint? Verbally, board ...

Different fonts, sizes, copy/paste (Time New Roman, 24 points)

Different fonts, sizes, copy/paste (Times New Roman, 32 points)

Different fonts, sizes, copy/paste (LM Roman Demi)

Different fonts, sizes, copy/paste (Cambria Math)

Different fonts, sizes, copy/paste (Elephant)

不同字型、大小（新細明體；32號字）

不同字型、大小 Chen’ s （標楷體；32號字）

不同字型、大小 Chen’s（標楷體＋Times New Roman；32號字）

不同字型、大小（特明體＋Times New Roman；32**號字）**

段距 18 points

How to give a talk

44 point, Times New Roman

Why? What? To whom? When? Where? (the 5Ws)

32 point, Times New Roman

- Targeted audience 32 point, LM Roman 9

  To astronomers? School kids? General public?
  For journal club? Colloquium? In English? 32 point, LM Roman 9, Italic

- Location

  In a small discussion room? In a lecture hall? Stadium?

- Use proper media

  PowerPoint? Verbally, board ...

<u>Astronomy Colloquium</u>

National Central University

Understanding Type Ia Supernova with UV Spectroscopy

by

Dr. Yen-Chen Pan (潘彥丞)

EACOA Fellow, NAOJ/ASIAA

at

Feb 15 (Friday) 2:00 pm
Chien-Shiung Building, Room 1013

Ultraviolet (UV) observations of Type Ia supernovae (SNe Ia) are useful tools for understanding progenitor systems and explosion physics. In particular, UV spectra of SNe Ia, which probe the outermost layers, are strongly affected by the progenitor metallicity. Theory suggests that SN Ia progenitor metallicity is correlated with its peak luminosity, but not its light-curve shape. This effect should lead to an increased Hubble scatter, reducing the precision with which we measure distances. If the mean progenitor metallicity changes with redshift, cosmological measurements could be biased. Models also indicate that changing progenitor metallicity will have little effect on the appearance of optical SN data, but significantly alter UV spectra. To address this problem, we reduced and published the largest UV spectroscopic sample of SNe Ia to date. With this sample, we confirm theoretical predictions that SN Ia UV spectra are strong metallicity indicators. Our findings show that UV spectra are promising tools to further our understanding of SN Ia while directly improving the utility of SN Ia for cosmology.

An example of a colloquium announcement

with layers of assorted, eye-catching information

An example of an award lecture

How to give a talk (*cont.*)

- Be prepared

  Expect to show only 10% of what you know

  Hide some slides after the end

- Be confident
- Practice efficient language
- Write legibly

  Text & graphics; do not overcrowd the page vs put immediate relevant contents side by side

- Stick to the time limit

  Rule of thumb, e.g., 10~12 slides for a 15 min talk

How to give a talk (*cont.*)

- Exercise gestures/body language (walk around sometimes)
- Do **NOT** block the screen
- Stick to the time limit
- Pay attention to your audience
- Sprinkle a touch of humor (but only a touch!)

Exercise:

- Give an “elevator talk”, about your research project.
- Limitations (How long, which elevator ☺) ?
  To whom?
  What do they care?
  Why should they care? Why should you?

How to do a presentation …

Why? What? To whom? When? Where?

- Be prepared (to show only 10% of what you know/prepare)
- Be confident
- Practice efficient language
- Use proper media (overhead, slides, PowerPoint; words only, blackboard …)
- Write legibly (text & graphics)

How to do a presentation …

Why? What? To whom? When? Where?

- Be prepared (to show only 10% of what you know/prepare)
- Be confident
- Practice efficient language
- Use proper media (overhead, slides, PowerPoint; words only, blackboard …)
- Write legibly (text & graphics)

How to be an audience?

- Do homework/preview work
  (what do you expect to learn?)
- Learn a thing or/then two
- Do **NOT** chat with others
- Ask questions during and after the talk
- Describe what you have learnt to a friend.

What's the first thing employers notice on a resume?

Brent Salish, former Executive (Retired) at Microsoft (1991-2008)
Answered Feb 27

I was downstream as a hiring manager, so by the time I saw resumes, they had already been screened as generally appropriate.

Three negatives would stand out to me immediately:

1. Job hopping - too many jobs in too short a period, especially recently. (I expect new college grads to wind up with a different job every summer! That kind of stuff doesn't count.) Long gaps would also catch my eye, but they weren't disqualifying; rather, if the rest of the resume appealed, I'd ask the recruiter to gather more info.
2. Typos. If you didn't have enough attention to detail to proofread, or weren't self-aware enough to know you needed to get someone to proofread, g'bye. (I'd be more lenient on resumes coming from overseas candidates where English was not one of the country's languages.)
3. General lack of self-awareness. Don't put your GPA on your resume if it's not a 4.0 or maybe one "B" short of that. Don't claim credit for things you couldn't have done, such as singlehandedly saving a company ten million bucks in an entry-level position. (Actually, that's occasionally possible, but you'd better explain it on the resume.) Being hand-wavingly vague about positions you held or what you accomplished. (Ex-CIA, yeah, okay, fine.) Focusing too much on stuff that doesn't matter (a college honor you earned fifteen years ago other than perhaps election to Phi Beta Kappa, which merits only a brief mention). Living on past glories, such as emphasis on stuff you did ten years ago to the exclusion to more recent victories.

Once you're survived that initial ten-second screening, then give me a reason to care, to want to hire you. Tell me about the difference you made somewhere (recently).

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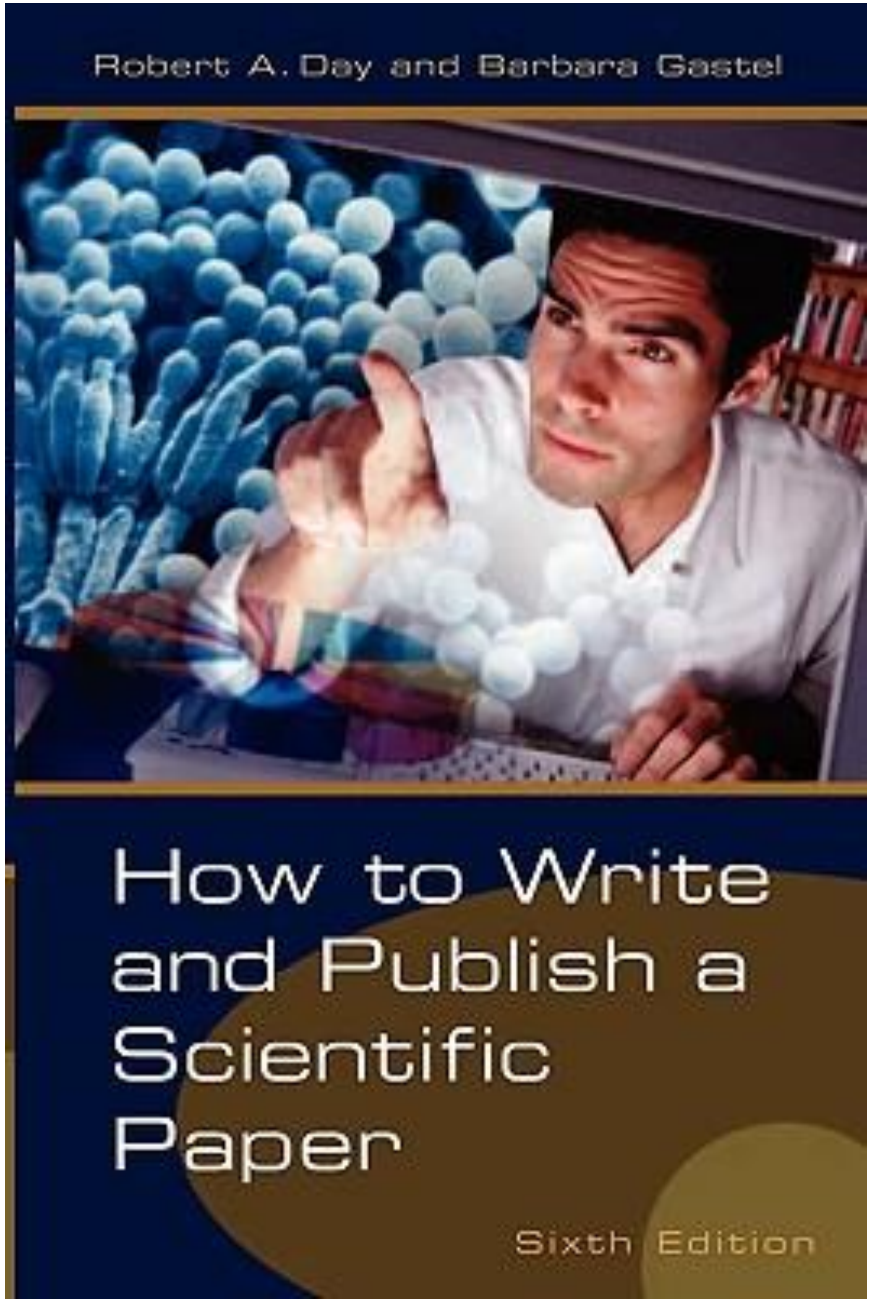
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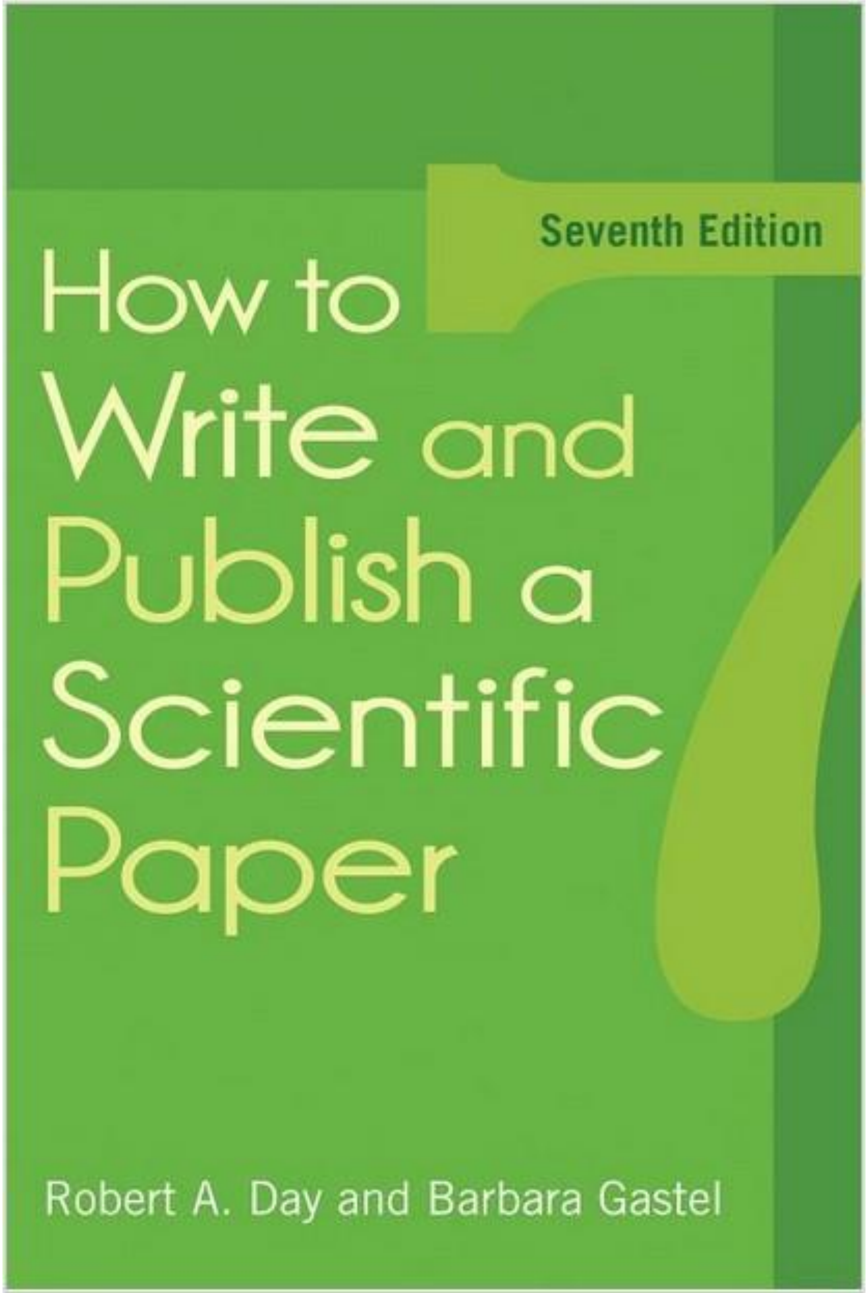
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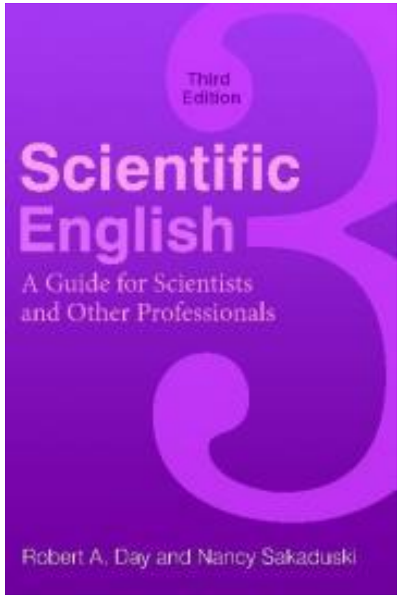

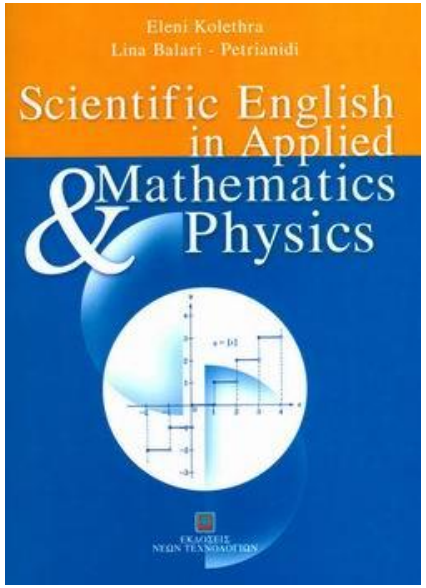

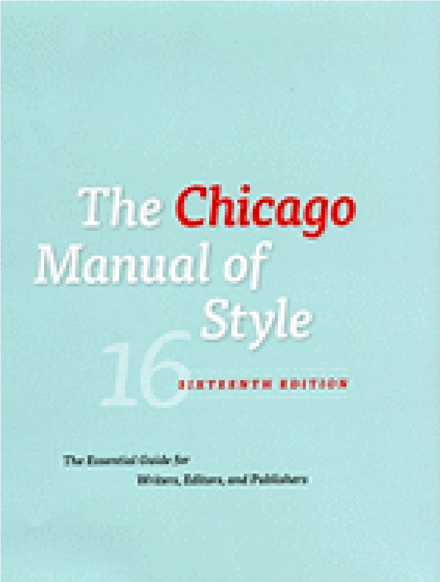

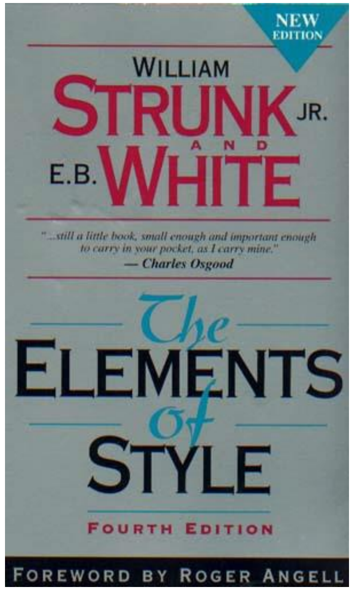

Common English mistakes made by native Chinese speakers
by Philip Guo

天文物理類英文科技論文寫作的常見問題　張雙南、許云

Contact Binary Variables as X-ray Sources

Kaushar Sanchawala [a], Wen-Ping Chen [a,b] and Mu-Zhen Chiou [b]
[a] Graduate Institute of Astronomy, National Central University, Chung-Li, Taiwan
[b] Physics Department, National Central University, Chung-Li, Taiwan
email: kaushar@outflows.astro.ncu.edu.tw

Abstract

We present cross-identification of archived x-ray point sources with optical variable stars found in All Sky Automated Survey (ASAS). In a surveyed sky area of 300 square degrees, 36 objects were identified as possible W Ursae Majoris type. We compute the distances to the W Ursae Majoris systems and present their x-ray luminosities.

The ASAS Project

- The All-Sky Automated Survey first ran with a prototype ASAS-1 and ASAS-2 equipped with 768X512 Kodak CCD and 135/f1.8 telephoto lens to monitor stars brighter than 14 magnitudes in the I band at the Las Campanas Observatory in Chile (4),(5).
- From April 7, 1997 to June 6, 2000, more than 140,000 stars had been observed in the selected fields covering ~ 300 square degree for nearly 50 million photometric measurements.
- More than 3500 variable stars have been found (ASAS-2) , of which nearly 90 % are new identifications. Among these 380 are periodic variables.
- The ASAS-3 system installed in August 2000, has discovered over 1000 eclipsing binaries, almost 1000 periodic pulsating variables, and over 1000 irregular stars among the 1,300,000 stars in the 0h-6h quarter of the southern hemisphere till date (6).

The W Ursae Majoris Variables

- W Ursae Majoris (also called EW) variables are contact eclipsing binaries, with periods p=0.2-1.4 days.
- Their light curves show two nearly equal minima with virtually no plateau.

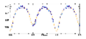

Fig. 1 HIP 59683 (HD 106400, AH Vir) is a W UMa type system with a period of 0.407528 days (http://astro.estec.esa.nl/Hipparcos/education_IcA.html)

- W UMa systems are known x-ray emitters. Stępień et. al (1) examined a sample of 102 such systems and found 54 of them to be x-ray sources.
- The x-ray emission mechanism of these systems is not clearly known but is thought to be related to stellar magnetic activity.
- A large sample of W UMa systems with x-ray emission is an important first step to shed light on their x-ray nature.

W UMa stars - Absolute Magnitude

- We made use of the ASAS-2 database of the variable stars and among the 380 periodic variables, identified 36 possible candidates of the W Ursae Majoris type.
- We searched the x-ray counterparts for these W UMa stars in the ROSAT database and found that 10 of the W UMa stars had x-ray counterpart (Angular separation $< 30''$).
- In some cases, the cross-identification was relatively straightforward, either because the nominal positions of the x-ray and optical source coincided (Fig. 2) or because no other obvious star was near the x-ray position (Fig. 3). The fig. 4 shows the light curves of a few W UMa stars for which we found the x-ray counterpart in the ROSAT database.

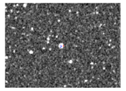

Fig.2 ASAS053959 6828.7

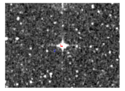

Fig. 3 ASAS184139 0044.7

DSS images : Red box indicates the positon of ASAS objects whereas the blue box shows the position of their x ray counterpart.

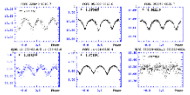

Fig. 4 Light curves of a few ASAS variables with x ray counterparts in ROSAT.

- For 8 of the W UMa stars, the angular separation was less than 30" whereas for the remaining 2 it exceeded this limit. We used S. Rucinski's absolute magnitude calibration method (2), (3) to compute the absolute magnitudes of the stars and hence their distances.

The exact calibration used is as given below.

$$M_I = b_{P(VI)} \log P + b_{VI}(V - I)_0 - b_{0(VI)}$$

where $b_{P(VI)} = -4.4_{[illegible]}$, $b_{VI} = 12.3_{[illegible]}$ and $b_{0(VI)} = 0.2_{[illegible]}$,

which is valid over the following ranges in period and color,

$0.27 < P < 0.63$; $0.38 < (V - I)_0 < [illegible]$ & $[illegible] < M_I < 5.0$.

- Two of the W UMa stars with x-ray counterparts, have the periods or colors outside the range of the calibration. Hence, we computed the absolute magnitudes of 8 W UMa stars in I band and their distances.

W UMa stars - X-ray luminosity

We computed the x-ray luminosities for the W UMa stars from their x-ray counts. The flux was obtained by multiplying the energy conversion factor with the count rates (1).

$ECF = (5.3HR - 8.7)10^{-12} erg\,cm^{-2} cts^{-1}$.

where the hardness ratio $HR = (H - S)/(H + S)$, for which H and S denote the source counts in the hard (0.5-2.0 keV) and soft (0.1-0.4 keV) passbands of ROSAT, respectively.

Table 1 lists the W UMa stars with their computed distances and their X-ray luminosities.

Table 1

RA	DEC	P	V – I	d	L_x
05:10:33	-68:13.6	0.2854	1.044	117	7.24×10^{29}
05:39:59	-68:28.7	0.3622	0.746	274	4.76×10^{29}
05:28:34	-68:36.2	0.4474	0.789	285	5.16×10^{29}
16:41:21	00:30.4	0.4533	0.654	97	1.87×10^{30}
18:41:39	00:44.7	0.2875	0.923	205	1.26×10^{30}
22:02:48	-12:18.7	0.3067	0.873	173	1.02×10^{30}
*11:47:37	-63:10.5	0.3392	1.131	111	5.17×10^{30}
*20:48:59	00:27.4	0.5134	0.664	493	2.90×10^{30}

d is the mean distance in parsec and L_x is the mean x-ray luminosity in erg.sec^{-1}.
*Angular separation of the counterpart is > 30".

X-ray luminosity vs. rotation

To study the interplay between stellar rotation and magnetic activity, we see that for single stars (Fig. 5) the x-ray luminosity increases with rotation, until $P < 1$ d, for which saturation occurs. The W UMa stars are tidally locked and all have periods below 0.63 d. As fast rotators, W UMa stars offer a good tool to investigate such relationship in contacting binary environment. Fig. 6 plots L_x versus period for W UMa stars, with data from (1) and (8) and our work. It appears that the faster an W UMa star rotates, the weaker its x-ray emission is, which may also be hinted in the single star data. The actual reason of this 'anti-correlation' is unknown, and we plan to study an enlarged W UMa sample (e.g., ASAS-3) for their x-ray emission to shed light on this issue.

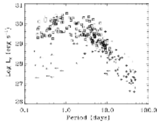

Fig. 5 X-ray luminosity vs. rotation of field dwarfs (crosses) and cluster stars (squares). Leftward arrows indicate field stars with periods derived from *v sin i* data, taken from (7).

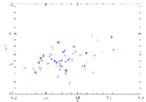

Fig. 6 The points in blue color are the values taken from (1), and in green color are the values taken from (8). The points in red color are the ones we obtained for the W UMa stars from ASAS-2.

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[8] P. A. McGale *et. al* in MNRAS 280, 627, (1996)

Acknowledgments

KS would like to thank Yang-Shyang Li, Chin-Wei Chen and Wen-Hau Yeh for all the help and to make her stay (both academically and otherwise) at NCU very enjoyable.

Last update: April 17, 2003

Deep Intermediate-Band CCD Photometry of Globular Cluster M13 and Its Stellar Population

Yang-Shyang Li & Wen-Ping Chen
Graduate Institute of Astronomy, National Central University, Chung-Li, Taiwan
email: m909003@astro.ncu.edu.tw

Abstract

We present CCD photometry, in 13 intermediate bands covering from 450-1000 nm, on the galactic globular cluster M13 (NGC 6205). The data — effectively low-resolution spectroscopy — were taken by the 60/90 cm Schmidt telescope, with a 1-degree field, as part of the Beijing-Arizona-Taipei-Connecticut (BATC) color survey. The spectral energy distribution of individual stars in the outer region of the cluster provides information of their membership and the evolutionary status of the cluster. We will also derive surface color gradient of the unresolved core, from which stellar population and the dynamical status of the cluster are inferred.

The Galactic Globular Cluster M13

- M13 (NGC6205, $\alpha = 16^h 39^m 54^s$; $\delta = 36°33'.2$), one of the biggest and prominent galactic globular clusters in the northern hemisphere, discovered by Edmond Halley in 1714.
- Distance to the sun: $7.2\ kpc$
- Metallicity $[Fe/H] = -1.54$, a low metallicity GC
- Core radius: $0.78'$
- Tidal radius: $25.8' \sim 1\ pc$ (Harris, 1996)
- The surface brightness profile is well fitted by King model.

BATC Color Survey

The Beijing-Arizona-Taipei-Connecticut (BATC) Color Survey of the Sky (`http://vega.bac.pku.edu.cn/batc/title/index.htm`) (Fan et al., 1996) is a large field and multi-color photometry project. The main goal of BATC is to obtain the SED of every celestial object in the program fields and to classify special objects such as QSOs and active galaxies based on SEDs with efficiency.
The BATC filter system including 15 intermediate band filters is designed to avoid the contaminations of sky background emissions. The transmission curve of each filter is shown in Fig.1.

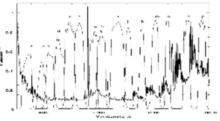


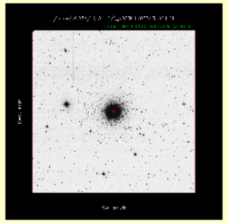
Fig.1 BATC filter system.

The BATC observations on M13 (see Table 1 for details) are performed with the 60/90 cm f/3 Schmidt telescope during 1995 to 2002. The telescope is equipped with a Ford 2048×2048 CCD which gives a $58' \times 58'$ field of view (plate scale=1.67"/pixel).

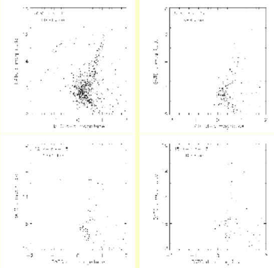
Table 1: Observational log of M13

No.	Filter	Wavel.(Å)	Exp.(s)	# stars
3	*c*	4193.5	300	1701
4	*d*	4540.0	15601	13174
5	*e*	4925.0	13511	11176
6	*f*	5266.8	7800	12450
7	*g*	5789.9	1800	11545
8	*h*	6073.9	10241	15197
9	*i*	6655.9	3000	18860
10	*j*	7057.4	4202	11895
11	*k*	7546.3	8400	13985
12	*m*	8023.2	10800	15684
13	*n*	8484.3	11400	14846
14	*o*	9182.2	15600	13029
15	*p*	9738.5	16800	10782

M13 in BATC p (9738Å) band.

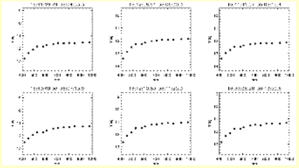


Color-Magnitude Diagram (CMD) & Stellar SEDs

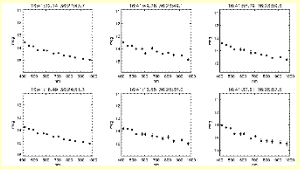


The BATC CMD is deep enough to allow for stellar population analysis of post-main sequence and some main sequence stars.

- Red Giant Branch Stars (RGBs)



- Blue Horizontal Branch Stars (BHBs)



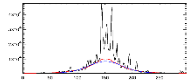
The BATC photometry provides unique information of the spectral type and existence of peculiar spectral lines of each object in the field, more so than a CMD.

Data Reduction and Calibration

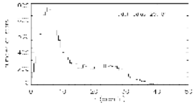
- The coordinates and instrumental magnitudes of stars are resolved with BATC Pipeline II (a customized DAOPHOT package).
- BATC magnitudes (Zhou et al., 2002) are defined on the Oke-Gunn (1983) system as AB_ν magnitudes. The AB magnitude relates to physical energy flux directly.
- After photometric calibration, we obtained the SED of resolved objects.

Stellar Population and Color Gradient

Color gradient has been seen almost exclusively in post-core-collapse clusters (in M30, M15 and 47 Tuc, Piotto et al. (1988), Burgarella et al. (1996), Guhathakurta et al. (1998)) which show a power law cusp in the core of their surface brightness profiles. So far there has been only one prominent case of color gradient detected in a King-type globular cluster, NGC 7089 (Sohn et al., 1996). The analysis of individual stellar SEDs in the outer region provide us the information of stellar population so does the color gradient, and after smoothing the extended core of M13 with a proper running-box median filter in order to mask the giant stars, we would exploit if such color gradient (hence stellar population or chemical abundance distribution) exists in M13.



A Halo in M13???



In the histogram of angular distance from an object detected in i band to the center of M13, we can depict an enhancement in star numbers around the tidal radius. The genuineness of the peak or its possible causes still need further examinations and explanations.

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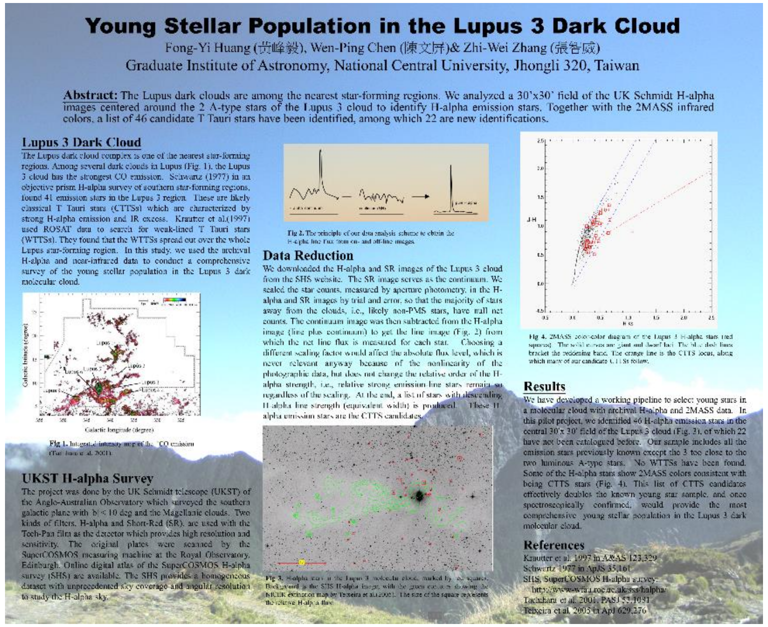
Acknowledgments

We would like to thank Zhou Xu and Jiang Zhao-Ji for the great help on data reduction and photometric calibration during Y. S. Li's visit to the Beijing Astronomical Observatory in November, 2002.

Last update: April 18, 2003



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