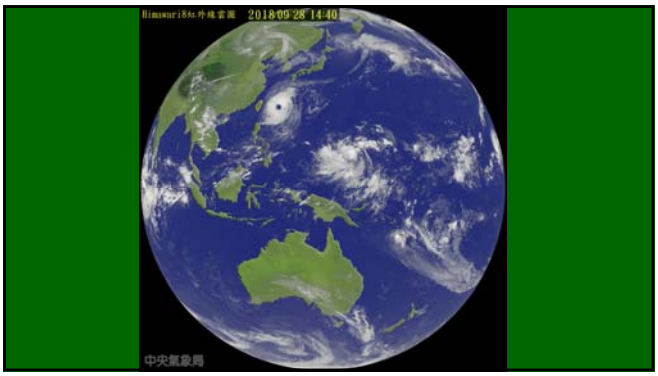
A Journey to the West

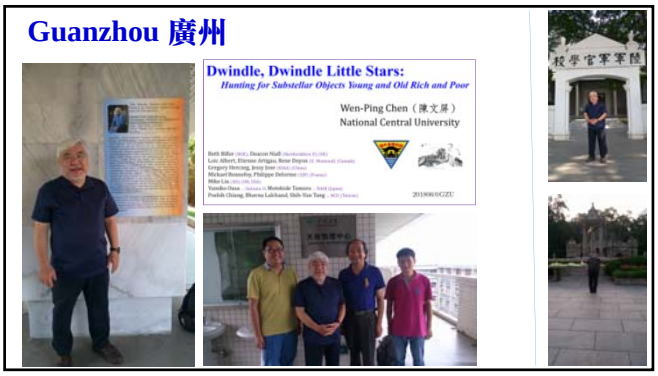
—— My Sabbatical Adventures

Wen-Ping Chen（陳文屏）
National Central University

Itinerary

- **Guanzhou**, China, 2018.06.28~30
- **Xinjiang**, China (Xinjiang Astronomical Observatory) Urumqi, Nanshan, Muztagata, 2018.06.28~08.15
- NCU, 2018.08.15~09.02
- **Kolkata**, India (S. N. Bose Centre for Basic Sciences), 2018.09.02~08
- **Nailital** (Aryabhatta Research Institute of Observational Sciences, ARIES), 2018.09.03~10.17
- **Pilani**, Birla Institute of Technology and Science (BITS), 2018.10.17~21
- NCU, 2018.10.21~



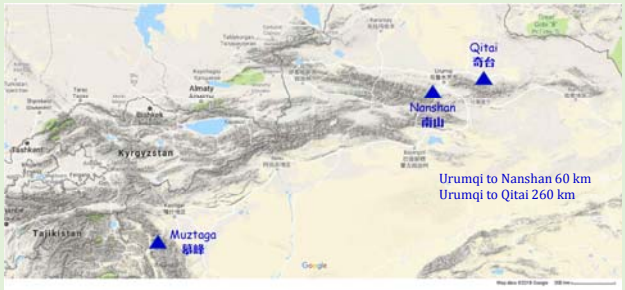


新疆維吾爾自治區 (Xinjiang Uyghur Autonomous Region)

Area
1,664,900 km^2
=1/6 China
=1/2 India

Xinjian Astronomical Observatory (XAO)

- Urumqi 烏魯木齊（迪化）... headquarter
- Nanshan 南山 ... established
- Qitai 奇台 TAOS/BEST ... developing
- Muztaga 慕士塔格 峰 to be developed
  Large OIR Telescope (LOT; 10 m)



The observatory sites in Xinjiang

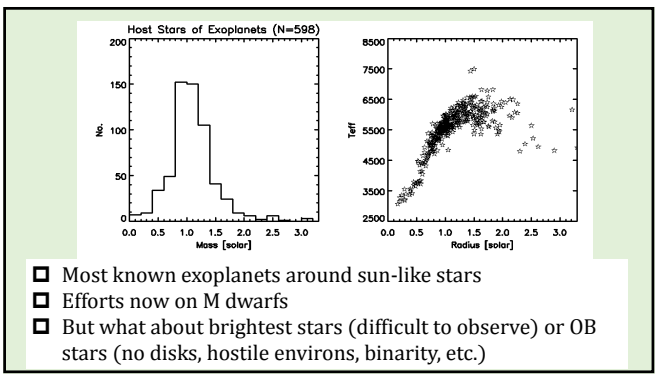
Team to Muztaga

Team to Qitai

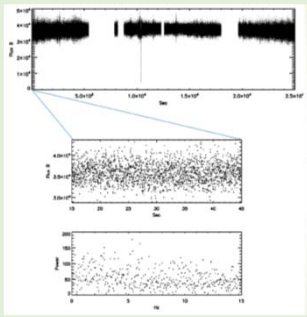
新疆奇台觀測站

奇台哈薩克族民房

哈薩克族叼羊比賽



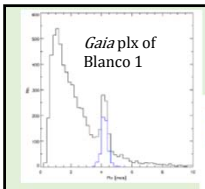
- Most known exoplanets around sun-like stars
- Efforts now on M dwarfs
- But what about brightest stars (difficult to observe) or OB stars (no disks, hostile environs, binarity, etc.)



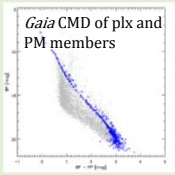
The frame-transfer CCD cameras (SI 805 SN 1021) can read out up to 70 Hz, so even very bright stars can be studied.

Fast photometry sandwiched by regular "stare" observations to detrend the light curve

→ Stellar variability

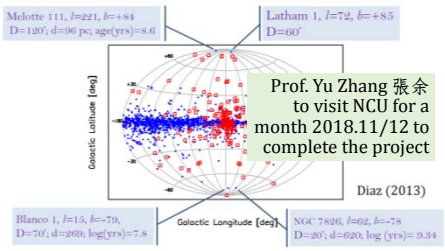


Gaia plx of Blanco 1



Gaia CMD of plx and PM members

Charactering the Galactic Star Cluster Blanco 1



Prof. Yu Zhang 張余 to visit NCU for a month 2018.11/12 to complete the project

20 hours of lectures

Stellar Formation and Evolution

恆星形成與演化

Wen Ping Chen 陳文屏
中央大學 天文研究所

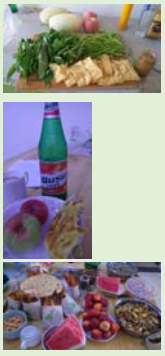
http://www.astro.ncu.edu.tw/~wchen/Courses/Stars/Default.htm

科技寫作與報告

陳文屏
中央大學 天文所
2018夏@新疆天文台

www.astro.ncu.edu.tw/~wchen/Courses/Seminar/techwriting.pdf

10 hours of lectures on "Technical Writing"



Wen-Ping Chen
8月5日 ·

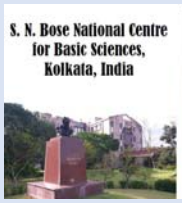
Dinner party ... The boy student at the left end cooked the chicken dishes 大盤雞 ..... they were delicious ... 新疆天文台晚餐聚會

XAO Star Formation Class 2018.07.27 (Friday) @ Chens

Second dinner party, before I departed …

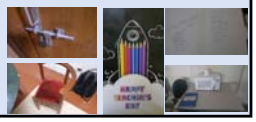
My Badminton pals

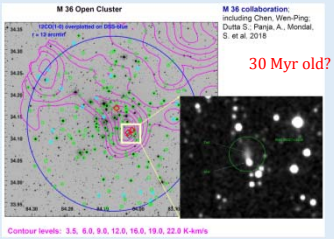
Bose Centre




Soumen Mondal and family


Lecture in the Fermion Room



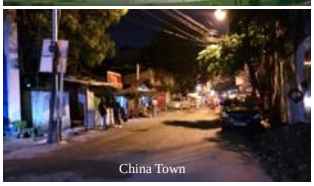


30 Myr old?

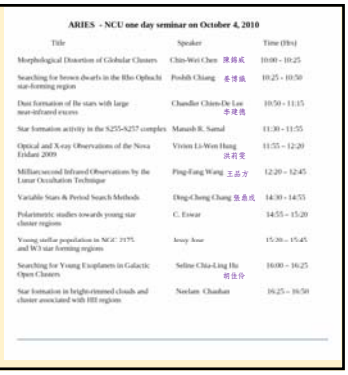
Somnath Dutta and Alik Panja visited NCU 2017/2018 for 2 months, and continued to work on M36 stars/YSOs with CO data (Purple Mt. Obs.)

Devendra Ojha to visit NCU in March 2019

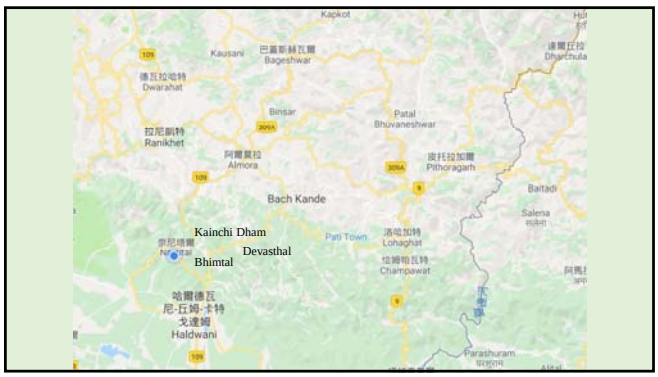

Queen Victoria Memorial


China Town

ARIES, Nailital

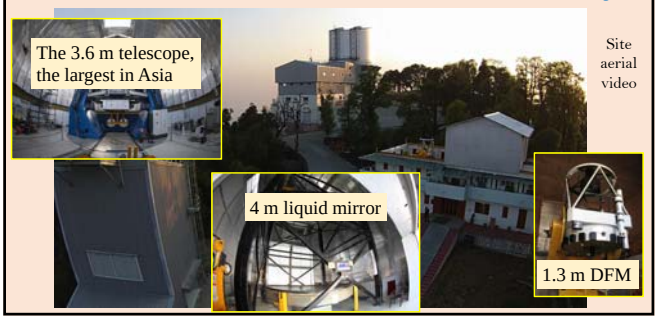


Nailital

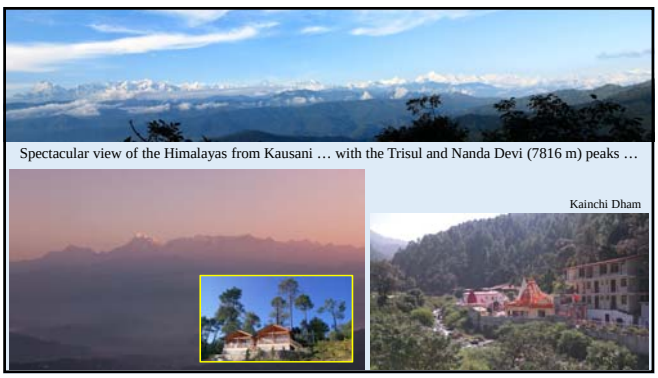


Devasthal Observatory

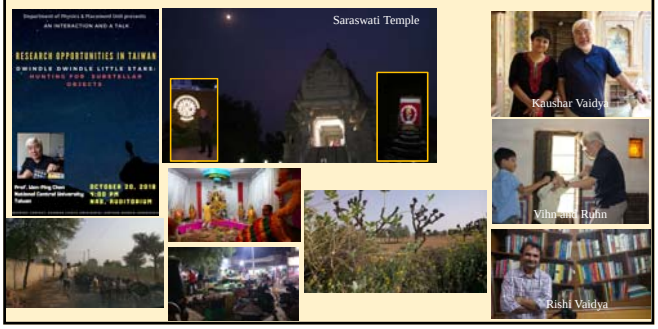
El=2450 m
Seeing 0.6"



ARIES students in the class "*Interstellar Medium and Star Formation*"



BITS (Birla Institute of Technology and Science) @Pilani



EDEN (Exoearth Discovery and Exploration Network)

Paul Ho <pho@asiaa.sinica.edu.tw> 2018年6月15日 上午11:44
收件者: Shiang-Yu Wang <sywang@asiaa.sinica.edu.tw>, Chen Wen-Ping <wchen@astro.ncu.edu.tw>
副本: Paul Ho <pho@asiaa.sinica.edu.tw>

dear wen-ping and shiang-yu, do we have any interest in taiwan to join such a search? i think it is to provide around-the-clock coverage.

best, p

---------- Forwarded message ----------
From: **Thomas Henning** <henning@mpia.de>
Date: Thu, Jun 7, 2018 at 7:33 AM
Subject: Potential collaboration
To: Paul Ho <pho@asiaa.sinica.edu.tw>, "Apai, Daniel - (apai)" <apai@email.arizona.edu>, Thomas Henning <henning@mpia-hd.mpg.de>

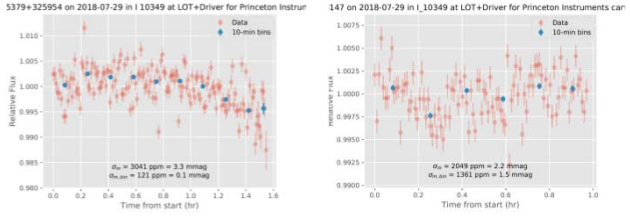
Dear Paul,

How are you doing? I hope things are getting better back home and you will find time to visit MPIA over the summer.

I am contacting you to explore your interest in a potential collaboration with us. Daniel Apai who is a Professor at the University of Arizona is setting up a project to search for habitable planets in the solar neigbourhood. with a network

July 29 Mr. Ou 歐佳宇 took a test run …

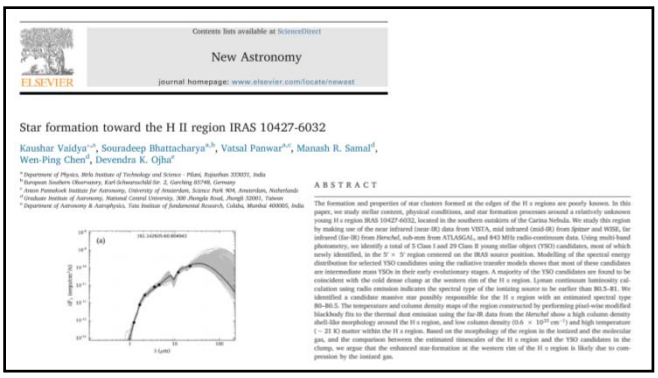
August 28 the processed LOT light curves came in …
< 2 mmag accuracy with 10 min binning w/o detrending



>>>>> Original Message <<<<<
From: Daniel Apai
To: Wen-Ping Chen
Cc: Thomas Henning;Paul Gabor
Sent Date: Tue,28 Aug 2018 23:29:00 Asia/Taipei
Subject: EDEN data analysis and next steps
Dear Wen-Ping (cc: Thomas, Paul),
we have completed a preliminary reduction and photometry of the Lulin datasets. Although further improvements in the future can be reached through de-trending (we are exploring several methods), the current reduction is already good enough to verify that the data are good quality and that the photometry will work well for the purposes of our survey.
I attached two PDF files with reduced lightcurves. These were taken for actual EDEN targets, late and fainter red dwarfs, and reach about <2mmag precision for 10-minute bins. We believe that with longer datasets and de-trending the photometry will improve further.
I wanted to let you know that we are glad to proceed with the process of NCU joining EDEN. I will be in touch with the next steps.
In addition, I wanted to let you know that we are preparing an online funding inquiry (pre-proposal) for the John Templeton Foundation. Anticipating that NCU is joining EDEN, we included a component (grad student support) for NCU in the draft budget. I plan to send you a draft shortly.
Best wishes,
Daniel

- NCU joins as a major partner (contributing 1-m class telescope time > 100 nights per year) along with U of Arizona/Steward Obs., Vatican Obs., & MPIA, plus several minor partners.
- To monitor nearby late-type M dwarfs to search for (transiting events by) exoplanets in the habitable zones
- To follow up *TESS* discoveries
- The first run in Sep: 3/5 clear nights with LCs of two targets. Next run in Oct 3/5.

You are invited … for exoplanet science, for stellar variability, etc.



Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/newast

Star formation toward the H II region IRAS 10427-6032

Kaushar Vaidya[a,*], Souradeep Bhattacharya[a,b], Vatsal Panwar[a,c], Manash R. Samal[d], Wen-Ping Chen[d], Devendra K. Ojha[e]

ABSTRACT

The Astrophysical Journal, 862:106 (28pp), 2018 August 1 https://doi.org/10.3847/1538-4357/aac87a

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Characterization of Stellar and Substellar Members in the Coma Berenices Star Cluster

Shih-Yun Tang[1], W. P. Chen[1,2], P. S. Chiang[2], Jessy Jose[3,4], Gregory J. Herczeg[3], and Bertrand Goldman[5,6]

湯士昀 [1] Department of Physics, National Central University, 300 Zhongda Road, Zhongli, Taoyuan 32001, Taiwan

[2] Graduate Institute of Astronomy, National Central University, 300 Zhongda Road, Zhongli, Taoyuan 32001, Taiwan

[3] Kavli Institute for Astronomy and Astrophysics, Peking University, Yi He Yuan Lu 5, Haidian District, Beijing 100871, People's Republic of China

[4] Department of Physics, Indian Institute of Science Education and Research, Rami Reddy Nagar, Karakambadi Road, Mangalam (P.O.) Tirupati 517507, India

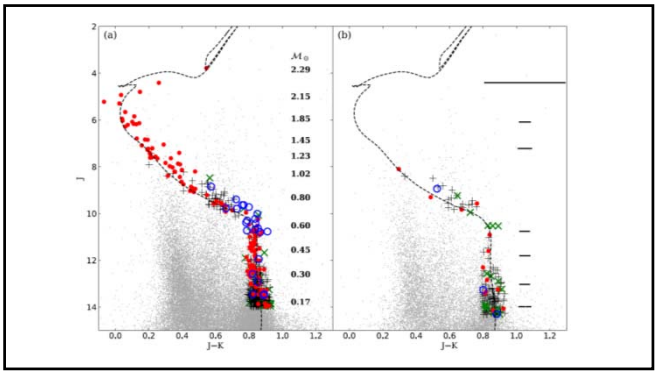
[5] Max Planck Institute for Astronomy, Konigstuhl 17, D-69117 Heidelberg, Germany

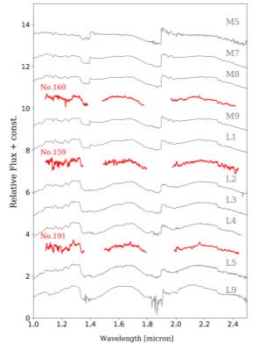
[6] Université de Strasbourg, CNRS, Observatoire astronomique de Strasbourg, UMR 7550, F-67000 Strasbourg, France

Received 2018 March 7; revised 2018 June 4; accepted 2018 June 4; published 2018 July 27

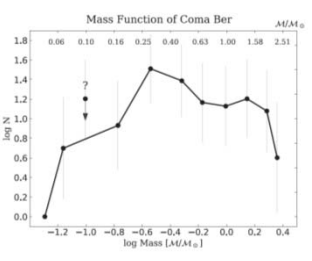
Abstract

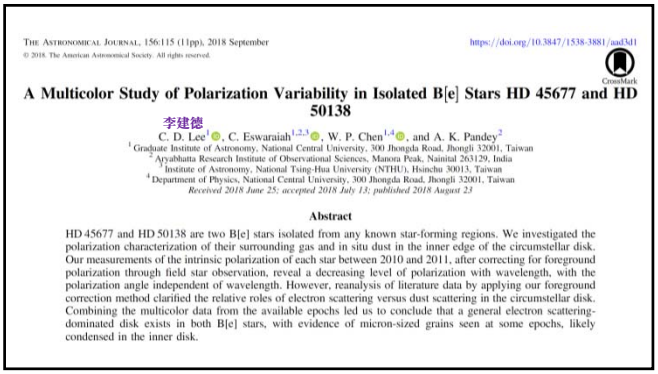
We have identified stellar and substellar members in the nearby star cluster Coma Berenices, using photometry, proper motions, and distances of a combination of 2MASS, UKIDSS, URAT1, and *Gaia*/DR2 data. Those with *Gaia*/DR2 parallax measurements provide the most reliable sample to constrain the distance, averaging 86.7 pc with a dispersion of 7.1 pc, and age of ~800 Myr, of the cluster. This age is older than the 400–600 Myr commonly adopted in the literature. Our analysis, complete within 5° of the cluster radius, leads to identification of 192 candidates, among which, after field contamination is considered, about 148 are true members. The members have $J \sim 3$ mag to ~17.5 mag, corresponding to stellar masses 2.3–0.06 $M_{\odot}$. The mass function of the cluster peaks around 0.3 $M_{\odot}$ and in the sense of $dN/dm = m^{-\gamma}$, where N is the number of members and m is stellar mass, with a slope $\alpha \approx 0.49 \pm 0.03$ in the mass range 0.3–2.3 $M_{\odot}$. This is much shallower than that of the field population in the solar neighborhood. The slope $\alpha = -1.69 \pm 0.14$ from 0.3 $M_{\odot}$ to 0.06 $M_{\odot}$, the lowest mass in our sample. The cluster is mass-segregated and has a shape elongated toward the Galactic plane. Our list contains nine substellar members, including three new discoveries of an M8, an L1, and an L4 brown dwarfs, extending from the previously known coolest members of late-M types to even cooler types.





← Discovery of L dwarfs in this nearby star cluster





The Astronomical Journal, 156:115 (11pp), 2018 September https://doi.org/10.3847/1538-3881/aad3d1

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A Multicolor Study of Polarization Variability in Isolated B[e] Stars HD 45677 and HD 50138

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[2] Aryabhatta Research Institute of Observational Sciences, Manora Peak, Nainital 263129, India

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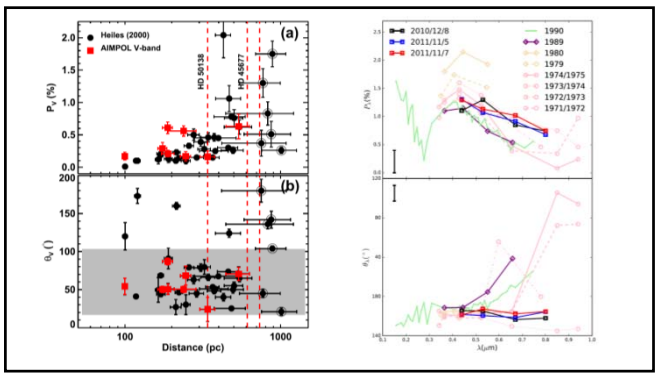
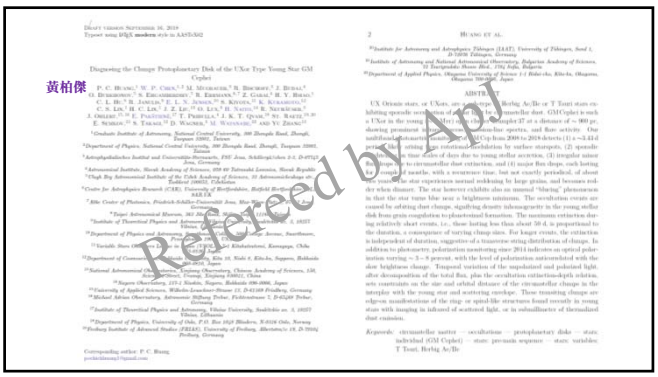
Received 2018 June 25; accepted 2018 July 13; published 2018 August 23

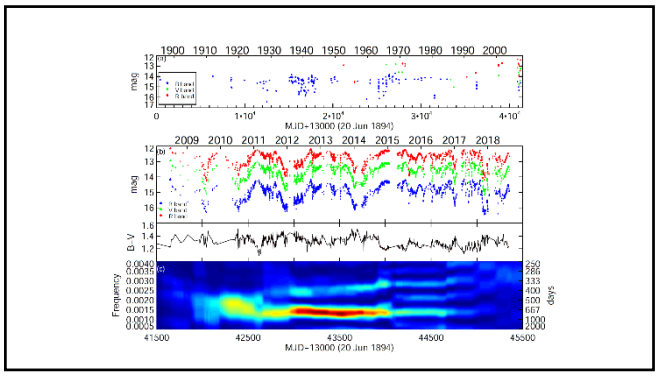
Abstract

HD 45677 and HD 50138 are two B[e] stars isolated from any known star-forming regions. We investigated the polarization characterization of their surrounding gas and in situ dust in the inner edge of the circumstellar disk. Our measurements of the intrinsic polarization of each star between 2010 and 2011, after correcting for foreground polarization through field star observation, reveal a decreasing level of polarization with wavelength, with the polarization angle independent of wavelength. However, reanalysis of literature data by applying our foreground correction method clarified the relative roles of electron scattering versus dust scattering in the circumstellar disk. Combining the multicolor data from the available epochs led us to conclude that a general electron scattering-dominated disk exists in both B[e] stars, with evidence of micron-sized grains seen at some epochs, likely condensed in the inner disk.



黃柏傑





The JCMT Transient Survey: An Extraordinary Submillimetre Flare in the T Tauri Binary System JW 566

The binary T Tauri system JW 566 in the Orion Molecular Cloud underwent an energetic, short-lived flare observed at submillimetre wavelengths by the SCUBA-2 instrument on 26 November 2016 (UT). The emission faded by nearly 50% during the 31 minute integration. The simultaneous source fluxes at and below the observation are 500 ± 107 mJy beam^{-1} at 450 μm and 160 ± 7 mJy beam^{-1} at 850 μm. The 850μm flux corresponds to a radio luminosity of $L_\nu = 8 \times 10^{19}$ erg s^{-1} Hz^{-1}, approximately one order of magnitude brighter (in terms of νL_ν) than that of a flare of the young star GMR-A, detected in Orion in 2003 at 3mm. The event may be the most luminous known flare associated with a young stellar object and is also the first coronal flare discovered at sub-mm wavelengths. The spectral index between 450 μm and 850 μm of $\alpha = 0.11$ is broadly consistent with non-thermal emission. The brightness temperature was in excess of 6×10^4 K. We interpret this event to be a magnetic reconnection that energised charged particles to emit gyrosynchrotron/synchrotron radiation.

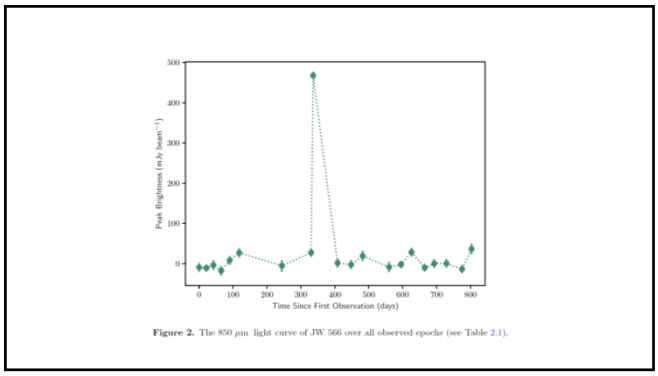


Figure 2. The 850 μm light curve of JW 566 over all observed epochs (see Table 2.1).

Astronomy & Astrophysics manuscript no. output
October 2, 2018
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Letter to the Editor

The blue straggler population of the old open cluster Berkeley 17

Souradeep Bhattacharya[1], Kaushar Vaidya[2], K. S. Baliyan[3], and Giacomo Beccari[1]

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e-mail: sbhattac@eso.org
[2] Department of Physics, Birla Institute of Technology and Science, Pilani 333031, Rajasthan, India
[3] Graduate Institute of Astronomy, National Central University, 300 Jhongda Road, Jhongli 32001, Taiwan

Submitted: October, 2018

ABSTRACT

Context. Blue Straggler Stars (BSSs) are observed in all the old stellar clusters (GCs) and old open clusters (OCs). Their radial distribution has been used as an indicator of dynamical evolution in GCs. Berkeley 17 (Be17) is the oldest known OC whose members, including BSSs, can now be identified with Gaia DR2.
Aims. We identify members of Be17 from the Gaia DR2 proper motions and parallaxes to find the BSSs population and its radial distribution to understand its dynamical evolution.
Methods. Using the proper motion and parallax information of Gaia DR2 counterparts of known members of Be17, we select cluster members to populate the colour magnitude diagram (CMD) in Gaia filters. Cluster properties are then derived using the brightest members, and the BSSs and giant branch stars are identified. We obtain the radial distribution of BSSs with respect to the giant branch stars and also compute the BSS segregation with respect to a reference population using a Minimum Spanning Tree (MST) method.
Results. We place Be17 at $3138.6^{+385.5}_{-353.8}$ pc. We find 23 BSSs in Be17, only two of which were previously identified. We find a bimodal radial distribution of BSSs with a minima at $r_{min} \sim 3.12'$, supported by the findings from the MST method.
Conclusions. The BSS are not clearly bifurcated in the CMD but do seem to follow two sequences, corresponding to two separate formation channels. The bimodal radial distribution of BSSs indicates that they have just started to sink towards the center of Be17. This is the first such determination for an OC.

MNRAS 000, 1–77 (2018) Preprint 16 October 2018 Compiled using MNRAS LATEX style file v3.0

Variable stars in the star-forming region towards IC 5070

Anupam Bhardwaj[1]*, Neelam Panwar[2], Gregory J. Herczeg[1] and TBD

1. Kavli Institute for Astronomy and Astrophysics, Peking University, Yi He Yuan Lu 5, Hai Dian District, Beijing 100871, China
2. Aryabhatta Research Institute of Observational Sciences, Manora Peak, Nainital 263002, Uttarakhand, India

Received on ; Accepted on

ABSTRACT

We present optical time-series photometry of 95 variable stars in the young star-forming region towards the Pelican Nebula (IC 5070). We classify the variable sources based on their location in the color-color and color-magnitude diagrams using optical and infrared data. Their physical association with the cluster IC 5070 is established based on the parallaxes and proper motions from the *Gaia* second data release. We find that around 70 of these variables are pre-main-sequence stars while nearly 20 variables are candidate main-sequence or field stars. Most of the pre-main-sequence variables are classified as classical T Tauri stars while 7 stars show strong periodic variability consistent with weak-line T Tauri stars. We also calculated the physical parameters of the variable stars using spectral energy distribution fitting tool as well as optical color-magnitude diagram. The typical age and mass of the pre-main-sequence variables is found to be $\leqslant 5$ Myr and $\leqslant 2\ M_{\odot}$, respectively.

In circulation among coauthors

Draft version November 2, 2018
Typeset using LATEX **modern** style in AASTeX62

Brown Dwarfs in LAMOST Survey: from late M to L stars

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In Preparation

ABSTRACT

We present a list of brown dwarfs serendipitously found in the LAMOST spectral sky survey. The stars with LAMOST spectra showing late-M types, typically with lower signal-to-noise than brighter targets, are analyzed with broad-band photometric colors to ascertain their brown dwarf nature.

One of the English versions, by Arthur Waley, published in 1942, "Adventures of the Monkey God".

An adventurous novel published in the Ming Dynasty in the 16th century, with authorship often attributed to 吳承恩 (1506 ~ 1582)

西遊記

A portrait of of Xuanzang（玄奘, 602~664, "Tripitaka" in Sanskrit）, the pilgrim who traveled to India, passing Pakistan, Nepal, Bangladesh, spending 18 years, to bring sacred scriptures of Buddhism back to China.

Sun Wukong（孫悟空）the rebel body guard

Conclusions

- It was a fruitful adventure, scientifically and culturally, by visiting many places, meeting with old acquaintances, making new ones, and teaching under different settings.
- "What matters is not how many hours you work in a day; it is how long you get to concentrate in a stretch."
- My geographical ignorance has been alleviated a bit; my experience with the Chinese and Indian ways of living has deepened and broadened. Languages in Thailand, Bhutan, Nepal, Myanmar, etc.
- The monk, now with the scriptures, is fully energized.