

國內教授孫維新 (Wei-Hsin Sun)

EDUCATION

- 1989 Post Doctor
 NRC Post Doctoral Research
 Goddard Space Flight Center
- 1987 Ph.D., Department of Astronomy,
 University of California
- 1979 B.S., Department of Physics,
 National Taiwan University



PROFESSIONAL POSITIONS

- 1992-present Associate Professor, Institute of Astronomy, National Central University
- 1989-present Associate Professor, Department of Physics, National Central University
- 1995-1998 Director, Institute of Astronomy, National Central University
- 1981-1982 Department of Physics, National Taiwan University

專書、視聽著作，及得獎記錄

- (1) 國科會「指導大專學生研究創作獎」(1997)。
- (2) 長榮環宇文學佳作獎「天地之旅」(1998)。
- (3) 中央大學理學院「優良教師獎」(2000, 2001 兩屆)。
- (4) 中央大學「教學傑出獎」(2004)。
- (5) 「航向宇宙深處」系列影集，2000，孫維新著。
(1994 金帶獎、1995 李國鼎科技節目獎，及 2000 金鐘獎。)
- (6) 「孫維新談天」，2002，孫維新著，天下文化出版。
(2003 行政院新聞局金鼎獎「推薦優良圖書」獎。)
(2004 吳大猷科普獎著作金籤獎。)
- (7) 「觀測天文物理」，2003，譯自“Observational Astrophysics”，by P. Lena，譯者：孫維新、胡景耀，國立編譯館，審定中。

最新研究方向

Active Galactic Nuclei (AGNs) and Quasi-Stellar Objects (QSOs)

My research interest focuses on the nature of the continuum emission and its variability in AGNs and QSOs. It is believed that these cosmological objects with non-stellar continuum and strong emission lines are powered by material accreting onto a supermassive blackhole at the center of these objects. The continuum emission across the whole electromagnetic spectrum comes from the surface of the accretion disk, the dust torus outside the disk, and the jet, respectively. The strong emission lines then are from the broad and narrow emission line clouds surrounding the central accretion disk. This picture, though successful in explaining a number of AGN phenomena, is still largely theoretical. To test this model observationally, we are carrying out the following research topics: (I) search for the signature of the accretion disk – we have obtained spectra for a sample of high-redshift quasars ($Z > 2.75$) with Lick 3-m Shane telescope in the near-UV wavelengths covering the redshifted Lyman limit region, to look for any change in continuum slope that might be the signature of an accretion disk. We are in the process of analyzing the high-resolution spectra and comparing the shape of absorption-corrected continuum with similar observations from HST and Hale 5-m telescopes on higher-redshift objects; (II) studying the geometry and kinematics of the inner-most region – we used the data archive from the International AGN Watch program to study if the observed time delay of emission line variation correlates with the luminosity of the object, to test the validity of the blackhole accretion disk model.

Beijing-Arizona-Taipei-Connecticut (BATC) Multi-Color Sky Survey

We have participated a large international consortium of a multi-color sky survey named BATC program since 1994. The participating institutes are Beijing Astronomical Observatory, National Central Univ., Arizona State Univ., Univ. of Arizona, and West Connecticut State Univ. The observational goal of this survey is to construct the crude spectral energy distributions (SEDs) with 15 color photometry for EVERY object down to $B=21$ in 500 selected fields covering an area of 450 square degrees in northern sky. The scientific goals are many-fold, including: (I) the study of the population and star formation history of nearby spiral galaxies, (II) the distribution of QSOs and the clustering effect over cosmological distances, and (III) search for high-redshift quasars and other peculiar objects with the 15 color SEDs. In the past 4 years, we have accumulated approximately 250 GB of data. We are in the process of calibrating and analyzing the data for the above research topics.

Selected Recent Publications:

1. X.-H. Fan, D. Burstein, **W.-H. Sun**, et al., (1996), “Deep, Wide-Field Spectro-photometry of the Open Cluster M67”, *AJ*, 112, 628.
2. Z.-H. Shang, D. Burstein, **W.-H. Sun**, et al.}, (1998), “Ring Structure and Warp of NGC 5907: Interaction with Dwarf Galaxies”, *ApJ*, 504, L23.
3. P.T. O’Brien, T.J. Turner, **W.-H. Sun**, et al., (1999), “Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. XIII.” *ApJS*, in press.

Active Galactic Nuclei (AGNs) and Quasi-Stellar Objects (QSOs)

My research interest focuses on the nature of the continuum emission and its variability in AGNs and QSOs. It is believed that these cosmological objects with non-stellar continuum and strong emission lines are powered by material accreting onto a supermassive blackhole at the center of these objects. The continuum emission across the whole electromagnetic spectrum comes from the surface of the accretion disk, the dust torus outside the disk, and the jet, respectively. The strong emission lines then are from the broad and narrow emission line clouds surrounding the central accretion disk. This picture, though successful in explaining a number of AGN phenomena, is still largely theoretical. To test this model observationally, we are carrying out the following research topics: (I) search for the signature of the accretion disk – we have obtained spectra for a sample of high-red shift quasars ($Z > 2.75$) with Lick 3-m Shane telescope in the near-UV wavelengths covering the red shifted Lyman limit region, to look for any change in continuum slope that might be the signature of an accretion disk. We are in the process of analyzing the high-resolution spectra and comparing the shape of absorption-corrected continuum with similar observations from HST and Hale 5-m telescopes on higher-red shift objects; (II) studying the geometry and kinematics of the inner-most region – we used the data archive from the International AGN Watch program to study if the observed time delay of emission line variation correlates with the luminosity of the object, to test the validity of the black hole accretion disk model.

Beijing-Arizona-Taipei-Connecticut (BATC) Multi-Color Sky Survey

We have participated a large international consortium of a multi-color sky survey named BATC program since 1994. The participating institutes are Beijing Astronomical Observatory, National Central Univ., Arizona State Univ., Univ. of Arizona, and West Connecticut State Univ. The observational goal of this survey is to construct the crude spectral energy distributions (SEDs) with 15 color photometry for EVERY object down to $B=21$ in 500 selected fields covering an area of 450 square

degrees in northern sky. The scientific goals are many-fold, including: (I) the study of the population and star formation history of nearby spiral galaxies, (II) the distribution of QSOs and the clustering effect over cosmological distances, and (III) search for high-redshift quasars and other peculiar objects with the 15 color SEDs. In the past 4 years, we have accumulated approximately 250 GB of data. We are in the process of calibrating and analyzing the data for the above research topics.

Selected Recent Publications:

1. X.-H. Fan, D. Burstein, W.-H. Sun, et al., (1996), “Deep, Wide-Field Spectro-photometry of the Open Cluster M67”, *AJ*, 112, 628.
2. Z.-H. Shang, D. Burstein, W.-H. Sun, et al., (1998), “Ring Structure and Warp of NGC 5907: Interaction with Dwarf Galaxies”, *ApJ*, 504, L23.
3. P.T. O’Brien, T.J. Turner, W.-H. Sun, et al., (1999), “Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. XIII.” *ApJS*, in press.