

## Fang Li-Zhi

Position: Professor of Physics and Astronomy

University of Arizona

Period covered: 1992- present



### I Scientific Work

In recent years Fang's research focus on non-equilibrium, non-linear problems of cosmology. It includes the turbulence-like dynamical behavior and log-Poisson hierarchical evolution of the mass and velocity fields of cosmic baryon fluid; the origin of the leaks in Ly-alpha absorption spectrum of high redshift quasars; the growth of ionized and heated region around photon sources in the early universe, and the 21 cm signal from the epoch of reionization.

### II Conferences and educational activities

Conferences and Other External Scientific Work

Colloquium: Scaling in Cosmology, Institute of Physics, Academia Sinica, Taipei, May 30, 2007

Invited lectures: 1. the standard cosmological model  
2. primordial perturbations  
3. nonlinear evolution of intergalactic medium (IGM)  
4. probe of dark energy with large scale structures

Taipei School/Workshop on Large Scale Structures of the Universe  
National Center for Theoretical Science, May 28 – June 2, 2007

### Work With Students

1. Alan Cooney, a new graduate student.
2. Susan Barke, final defence
3. Veron Miller, committee member, oral exam
4. Bauman, Sky, committee member
5. Jessica Uscinski, committee member, oral exam
6. Ziran Wu, committee member, oral exam

## Diploma thesis supervision

Hu Zhan, obtained his PhD degree

Thesis: The Large-Scale Structure of the Universe in One Dimension.

## Other Teaching Duties

Phys571 (general relativity and cosmology)

Phys195A (creation of the universe)

Phys596F (Cosmology and particle astrophysics)

## Work With Postdocs

1. Postdoc: Tong-Jie Zhang (stay in my group from June 1, 2005 - May 31, 2006)

Publications in this period: X-ray emission of baryonic gas in the universe:  
luminosity-temperature relationship and soft band background,  
ApJ, 642, 625 (2006)

2. . Postdoc: Xin-He Meng (stay in my group from June 1, 2004 - Jan 31, 2005)

Publications in this period: Codimension Two Branes in Einstein-Gauss-Bonnet  
Gravity, Phys.Rev. D71 (2005) 024023

3. Postdoc: Ji-Ren Liu (stay in my group from Aug 8 2006 - present)

Publications in this period: 1. Is the cosmic UV background fluctuating at  
redshift  $z \sim 6$ ? ApJL, 645, 1, (2006)

## III Service activities

### Within ICRANet

Organizing the 4<sup>th</sup> Italian-Sino Workshop

Member and Chair of Steering Committee

### Outside ICRANet

Editor, International Journal of Modern Physics A (2003 - )

Editor, Modern Physics Letters A (2003 - )

## IV 2007-2008 List of Publications

2007 A WENO algorithm of the temperature and ionization profiles around a point source, J.M. Qiu, L. L. Feng, C.W. Shu and L. Z. Fang, New Astronomy, 12, 398

Estimating power spectrum of Sunyaev-Zeldovich effect from the cross-correlation between WMAP and 2MASS, L. Cao, J.R. Liu, and L.Z. Fang, Astrophys. J., 661, 641

21 cm signals from early ionizing sources, J. R. Liu, J.M. Qiu, L. L. Feng, C. W. Shu and L.Z. Fang *Astrophys. J.*, 663, 1

Book Review: History of Purple Mountain Observatory, L.Z. Fang, *Isis*, in press 2008

A WENO algorithm for the growth of ionized regions at the reionization epoch, J. M. Qiu, C.W. Shu, J.R. Liu and L.Z. Fang, *New Astronomy* in press

Non-Gaussianity of the Cosmic Baryon Fluid: Log-Poisson Hierarchy Model, J.R. Liu and L. Z. Fang, *Astrophys. J.*, in press

DWT Analysis of the 2-degree Field Galaxy Redshift Survey, Y.-C. Cai, J. Pan, L.L. Feng and L.Z. Fang, *ChJAA*, in press

The DWT power spectrum of the two-degree field galaxy redshift survey, Y.C. Cai, J. Pan, Y.H. Zhao, L.L. Feng and L.Z. Fang

Twenty one cm signals from ionized and heated regions around  $\text{H I}$  stars, L.Z. Fang, Ly\_ Leaks and Reionization, L.L. Feng, H.G. Bi, J.R. Liu and L.Z. Fang, *Mon. Not. R. Astr. Soc.*, in press

Li-Zhi Fang (Western version) or Fang Lizhi (Chinese version) was born in Beijing in 1936. He received his diploma of physics from Beijing University in 1956, and immediately joined the Chinese nuclear project as a junior researcher. For his speaking out on freedom of thought and expression, Fang was dismissed, and transferred to the University of Science and Technology of China (USTC) as an assistance in 1958 and lecturer in 1961. During the Cultural Revolution (1966-1976), he was sent to do labor in the country side and in the coal mine. In 1978, Fang became a full professor of physics and later the Vice-President of the USTC in 1984. Owing the student movement in 1986, Fang was once again dismissed, and moved to the Beijing Astronomical Observatory in 1987, and then headed a group of theoretical astrophysics from 1987 to 1989.

Following the bloody event on Tiananmen Square on June 4th 1989, Fang was named the most wanted counter-revolutionary criminals by the Chinese authorities. He then sought sanctuary in the US Embassy in Beijing, where he remained for over a year. When he got out of China in 1990, he stopped at the Cambridge University as a Guest Professor of the Royal Society, and in the following year at the Institute for Advanced Study of Princeton as a Director's Visitor. Since 1992, Fang joined the faculty of the University of Arizona as a Professor of Physics.

Fang's research has covered nuclear physics, laser physics, and a variety of topics in theoretical astrophysics and cosmology. He has published more than 330 research papers, and also numerous popular articles. He is the author, co-author and editor of 24 books. Fang has been a member of many scientific committees, including the council of the International Centre for Theoretical Physics (Trieste), Commission No.2 of the International Union of Pure and Applied Physics (IUPAP) and 1990-1993 Chair of the Commission C19 of IUPAP.

Fang has served on many organizations of human rights, including the International League for Human Rights, Committee of Concerned Scientists, and he was 1994 Chair of the APS Committee on International Freedom of Scientists.

Fang was a member of the Chinese Academy of Science. He is a fellow of the American Association for the Advancement of Science, and Founding Fellow of Arizona Arts, Sciences and Technology Academy. Fang is the recipient of numerous awards, including the 1978 (Chinese) National Award of Science and Technology, 1985 First Award of the Gravity Research Foundation, 1987 (Chinese) National First Award for Scientifically Popular Article, 1989 Human Rights Award of Robert F Kennedy, 1991 Freedom Award of International Rescue Committee and the 1996 Nicholson Medal of the American Physical Society.