

Workshop on Massive Black Hole Binaries and their Coalescence in Galactic Nuclei  
July 20-25, 2009, Peking University, Beijing  
(1st announcement)

Massive black hole binaries are predicted by hierarchical galaxy formation models, and galaxy mergers are observed frequently in the Universe. The binary black hole coalescence gives rise to strong gravitational wave radiation. Detecting this radiation is the main goal of the Laser Interferometer Space Antenna (LISA), and the ongoing gravitational wave detection program based on pulsar timing (PTA). Recent breakthroughs in numerical relativity have allowed us to accurately simulate the merging process of binary black holes with random masses and spin angular momenta. Mass and spin of the merged black hole, the character of the formed gravitational waves, and the recoil velocity sensitively depend on the initial parameters of the binary system, which are in turn affected by the astrophysical environment in which the merger occurs. How efficiently the massive black hole binaries formed in galaxy mergers actually coalesce, is determined by the interaction of massive black hole binaries with the gaseous and stellar environment in galactic nuclei. The black hole coalescence rate, and their mass and spin evolution, in turn is a very important parameter in the context of understanding galaxy formation and evolution at the epoch of structure formation, the feedback of black holes to the galaxy structure and activity in galactic nuclei. Therefore, accurate modeling of the early phase of black hole mergers, of the late phase of gravitational wave emission, and of the electromagnetic signatures of binary black holes and recoiling black holes are of great interest. Our workshop on "Massive Black Hole Binaries and Their Coalescence in Galactic Nuclei" aims at bringing together experts from the different fields, linking simulations and observations. It will be held at the newly founded Kavli Institute for Astronomy and Astrophysics in Peking University (KIAA-PKU) in July 20-25, 2009. The number of participants of the workshop will be limited to about 70. If the number of applications exceeds the maximum number, participants will be selected on a first come first serve basis.

**The workshop will cover the following themes:**

- 1. The link of massive black hole binaries to the galaxy formation and evolution.**
- 2. The theory and numerical hydrodynamic simulations of massive black hole binaries in gas-rich galactic nuclei.**
- 3. The theory and numerical computations on stellar dynamics of massive black hole binaries in galactic nuclei.**
- 4. The astrophysics of massive black hole binaries.**
- 5. The electromagnetic signatures of binary black holes and recoiling black holes and their effects on the activities of active galactic nuclei and transient activities of normal galactic nuclei, including the current observations of massive black hole binaries and recoiling black holes.**
- 6. Numerical simulations and approximation techniques of the mergers of black hole binaries.**
- 7. The detection of gravitational waves.**

KIAA-PKU under the leadership of its founding director, Prof. Doug N.C. Lin, promotes basic research in China with the highest international standards and carries out research on astronomy and astrophysics. The KIAA buildings with traditional Chinese architectural style is located inside the beautiful area of the university campus, Langrunyuan near Weimins Lake which was a part of the Old Summer Palace. The campus of Peking University at the side of Yuanmingyuan is located in the Northwest part of Beijing city and is only about 20 minutes walking distance from the Summer Palace and only about 50 minutes from the Great Wall by car. It is also very convenient for one to go from the university campus to the Forbidden City and Tiananmen Square. It is also very easy to reach from Beijing Capital International airport. A total solar eclipse will take place in central China on July 22, 2009, during our workshop. However, we will neither arrange a trip to see it, nor encourage participants to go individually.

Dates:

July 20-25, 2009

Reception date:

July 19, 2009

Place:

Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing

Registration deadline:

May 31, 2009

Workshop website:

<http://vega.bac.pku.edu.cn/fkliu/binary09/>

Scientific Organizing Committee (SOC):

Fukun Liu (PKU, China; Chair), Sefanie Komossa (MPE, Germany), Doug N.C. Lin (UC Santa Cruz USA; PKU, China), David Merritt (RIT, USA), Luciano Rezzolla (AEI Germany) Rainer Spurzem (Heidelberg Univ., Germany), Xue-Bing Wu (PKU, China), Qingjuan Yu (PKU, China)

Local Organizing Committee (LOC)

Jie Yao, Xian Chen, Shuo Li, Ying Jiang, Fukun Liu (Chair), Xue-Bing Wu, Qingjuan Yu, Ning Zhang, Shuai Zhou, Wenwen Zuo

Sponsors:

Peking University (PKU)

Co-sponsors:

National Astronomical Observatory of China (NAOC), Shanghai Astronomical Observatory (ShAO), Chinese Astronomical Society (CAS), Chinese national 973 programs "Cosmic Large-scale Structure & Galaxy Formation and Evolution"

Registration fee:

300 Euro for general participants;

200 Euro for PhD students;

200 Euro for companions;

Free for Children (under 12 years old).

The payment should be made at the reception desk upon arrival.

Conference secretary:

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