

The Global COE Program

“The Next Generation of Physics, Spun from Universality and Emergence”

Bilateral International Exchange Program (BIEP, invite) report

Send report to: Your responsible Professor in Kyoto University

[gcoe-biep@scphys.kyoto-u.ac.jp](mailto:gcoe-biep@scphys.kyoto-u.ac.jp) , [gcoe-office@scphys.kyoto-u.ac.jp](mailto:gcoe-office@scphys.kyoto-u.ac.jp)

(Year/Month/Day) 2010/3/4

**Invited Student**

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Name                               | Xiaohong Cui                      |
| University and Country             | Peking University, China          |
| Grade                              | 4 <sup>th</sup> year for PhD      |
| Phone and FAX                      | +86-10-62741978, +86-10- 62765031 |
| e-mail address                     | xhcui@bac.pku.edu.cn              |
| URL                                |                                   |
| Name and Position of Ph.D. advisor | Prof. Renxin Xu                   |
| e-mail address of Ph.D. advisor    | r.x.xu@pku.edu.cn                 |

**Responsible Researcher in Kyoto University**

|                   |  |
|-------------------|--|
| Name              | Shigehiro Nagataki   |
| Group and Faculty | Astrophysics & Cosmology, Yukawa Institute for Theoretical Physics |
| Position          | Associate Prof.  |
| e-mail address    | nagataki@yukawa.kyoto-u.ac.jp                                      |
| Phone and FAX     | +81-75-753-7019, +81-75-753-7010                                   |

**Research Project**

|          |   |
|----------|---|
| Title    | Revisited Progenitors of Short Gamma-Ray Burst Offsets to Their Host Galaxies |
| Duration | 50 days   |

Please summarize your activities and results during your stay in Kyoto University. Also please describe how your stay has been beneficial to the graduate students in the institute. You can add a sheet, if you need more space.

You can also write any comments and requests to the GCOE program.

Thank GCOE program very much to give me a chance to stay in Kyoto University last year!

Most of the time when I stayed in Kyoto University were for the research project we were interested in: Revisited the progenitors of short Gamma-ray bursts from the offset to their Host galaxies. At the beginning of this work, I investigated all the papers discussing about the new data of short GRB and their progenitor models. I knew the current situation about the short GRB progenitor and the observations from these papers. Through the discussion with Prof. Nagataki, I was clear about the idea and method to study the progenitor of short GRB from their offset. Based on the models provided by the population synthesis method and that from the observation of the star formation disk of galaxy, I got the fraction of the massive star collapse as one of the origin of short GRB from the best fitting results about the cumulative offset distributions. The fraction of the late-type host galaxy among all type of the host galaxies was also obtained and was consistent with the observed late- to early-type ratio if the mass function of the host galaxy is uniform.

This work provides a good method to study the progenitor of short GRBs. The properties of the host galaxies shed light on the evolution and the environment of progenitor.

Many discussions with Prof. Nagataki and Junichi Aoi kept the work go well. Much I have learned not only from their thoughts but from the way to solve the problem. Of course, the exchange with the graduate students in the institute is also one of aims of this exchange. We talked about our studies, our thoughts and the experience during our study including the gladness and doubt. The encouragement and the successful cases always inspire us much. Exchange promotes science development as like the sublimation of the thought leads to development of the human. Science is international. The virtue of the human stays same everywhere. I can feel about these when I stayed at Kyoto.

I hope another opportunity to come Japan again! Good memory, well collaboration, beautiful scenery!

Thank GCOE program!