The Global COE Program
"The Next Generation of Physics, Spun from Universality and Emergence"
Bilateral International Exchange Program (BIEP, invite) report

Send report to: Dr. Taichi Kato tkato@kusastro.kyoto-u.ac.jp,
gcoe-biep@scphys.kyoto-u.ac.jp , gcoe-office@scphys.kyoto-u.ac.jp

(Year/Month/Day)_____2012/12/30_____

Invited Student

Name	Polina Zemko
University and Country	Lomonosov Moscow State University, Russia
Grade	1-st
Phone and FAX	+79104388570
e-mail address	polina.zemko@gmail.com
URL	
Name and Position of Ph.D. advisor	Sergei Shugarov, senior researcher of Sternberg Astronomical Institute, Lomonosov Moscow State University and Astronomical Institute of Slovak Academy of Sciences
e-mail address of Ph.D. advisor	sg@sai.msu.ru

Responsible Researcher in Kyoto University

Name	Taichi Kato
Group and Faculty	Department of Astronomy
Position	Assistant Professor
e-mail address	tkato@kusastro.kyoto-u.ac.jp
Phone and FAX	+81-075-753-3895, +81-075-753-3897

Research Project

Title	"Investigation of Superhump Phenomenon in Dwarf Novae"
Duration	89 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 host institute. You can add a sheet, if you need more space.
You can also write any comments and requests to the GCOE program.

During my stay in Kyoto University I participated in investigation of cataclysmic variable stars in general and superhump phenomenon, particularly its connection with the mass transfer rate change. Under the supervision of Dr. Kato T. I worked with VSNET database, learned new methods of statistical data analyses, studied theoretical aspects of cataclysmic variables, took part in the research projects, prepared publications. I also participated in the common seminars with Smooth Particle Hydrodynamics theoretical group and in observations.

As the result three papers were prepared:

1. "Detection of Change in Supercycles in ER Ursae Majoris", Polina Zemko, Taichi Kato, Sergei Yu. Shugarov accepted to PASJ, published in Astro-ph (http://arxiv.org/abs/1212.5940)

2. “Estimates of the accretion disc radius in Dwarf Nova Pegasi 2010”, Polina Zemko, Taichi Kato accepted to Astrophysics
3. “ Photometric and spectroscopic analisys of TT Ariets in the high and low states during 2004-2012”, Polina Zemko, Taichi Kato et al. is in final preparation for submission to PASJ

Under the supervision of Dr. Nogami D. I took part in the observations at:

1. Kouyama Observatory of Kyoto Sangyo University 2012/11/13 and 2012/11/09 (multicolor photometry of ER UMa)
2. Nishi-Harima Astronomical Observatory 2012/12/12 and 2012/12/13 (spectroscopy of ER UMa)

Every week I (together with Dr. Kato T., undergraduate students that will be PhD students next spring and current PhD students of astronomical department) participated in the group readings of scientific literature, practical lessons of data analyzing, Smooth Particle Hydrodynamics simulations seminars. During the latter we not only learned the theory of the method but applied it to the real objects.

Every day we had discussions in English and Russian lessons, too.

I made regular reports about the status of my researching work, reviews of the recent and most important theoretical papers. During the Wednesday seminar and Thursday lunch seminar I made presentations about the Lomonosov Moscow State University, Sternberg Astronomical Institute and science and life in Russia.

During the visit of Dr. Osaki Y. to the Kyoto University I made reports about my work and received valuable comments and advices from him.

My stay in Kyoto University was beneficial for the students for several reasons:

1. Students of the Astronomical Department of Kyoto University, in particular the group of Dr Kato T. had daily experience of communication in English, of answering questions in English during the reports. We discussed not only scientific topics but culture, traditions and other various subjects, providing not only English practice but broadened horizons, too.
2. Regular joint seminars with the undergraduate (future PhD) students helped them to understand the subject better, get new knowledge and experience.
3. Working together, discussing the problems, results and experience exchange were also valuable for promotion of research of the PhD students.

Collaboration with the theoretical (SPH) group gave opportunity to apply the modern theoretical models to practice, comparing the results of modulation with the real light curves and to explain the observed features with unknown nature with help of modulation.