The History and Aim of LADY CATS (Physics women teachers in Japan)

Masako TANEMURA[a], Fumiko OKIHARU[b], Kyoko ISHII[c], Haruka ONISHI[d], Mika YOKOE[e] and Hiroshi KAWAKATSU[f]

[a] *Osaka Kyoiku University, Osaka, Japan*
[b] *Niigata University, Niigata, Japan*
[c] *University of Fukui, Fukui, Japan*
[d] *Marugame High School, Marugame, Japan*
[e] *Kokoku High School, Osaka, Japan*
[f] *Meijyo University, Aichi, Japan*

Abstract. We would like to introduce the history, aim, and our educational contents of LADY CATS (LADY Creators of Activities for Teaching Science). We had demonstration "Simple and beautiful experiments" in ICPE2005, ICPE2006, ICPE2007, ASE2008. We will show and demonstrate some experimental tools.

Keywords: LADY CATS, Physics Education, Simple and Beautiful Experiments
PACS: 01.50.My (Demonstration experiments and apparatus)

WHAT IS "LADY CATS"?

LADY CATS is a science teachers' organization mainly consisting of women ranging from primary school teachers to university researchers. Our activities aim at encouraging students and teachers who are not interested in physics. Recently many primary teachers feel uncomfortable with science because they have studied only general science and they feel it is not enough to teach science, especially physics. There are many women teachers at primary schools. Moreover not many girls major physics, too. It causes there are fewer women physics teachers in higher education.

We formed LADY CATS in 2005 to change these tendencies through our activities. We are dedicated to exhibiting simple yet beautiful science experiments that demonstrate the principles of physics. These experiments should be easy to prepare at low costs. We presented some experiments in international conferences such as ICPE with male teachers.

The name of LADY CATS is taken over from the group called "STRAY CATS". They have introduced interesting experiments by demonstrations at numerous international conferences for over twenty years, and now most of them are near retirees.

We believe that our activities fascinate many people through our passion in physics.

FIGURE 1 Hands-on workshop in ICPE2006(a).

FIGURE 2 Hands-on workshop in ICPE2006(b).

EDUCATIONAL CONTENTS

1. The Science of Soap Films

Due to the surface tension, a film of soap is formed within a shaped wire framework with a minimum surface area (FIGURE 3, 4). Belgian physicist Joseph Plateau demonstrated it in 1873.

Soap Film experiments strike students' interest in surface tension. The experiments are not only visually appealing, but the outcomes usually contradict the predictions.

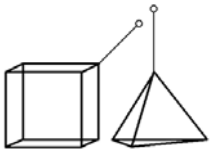

FIGURE 3

FIGURE 4

2. Inclined Plane and Double Cone

This is an apparatus designed to about the movement of the center of gravity (FIGURE5). A double cone looks like going up on inclined plane, but in fact, its center of gravity is moving downwards on the plane (FIGURE 6).

FIGURE 5

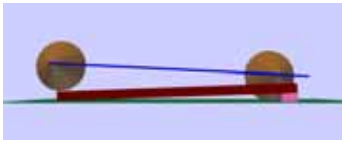

FIGURE 6

3. Balancing Toy "DRAGONFLY"

When wings are bent to forward, it balances (FIGURE 7). It is good to think about gravity. Center of gravity moves ahead when wings are bent to forward.

4. Finger Cobra

Finger Cobra (FIGURE 8) is originally made of Bamboo leaves in Okinawa, Japan. There are dangerous Cobras called "HABU". Once "HABU" bites your finger, you cannot pull it out. The Finger cobra is a good tool to know how dangerous the HABU is, and it also is good tool to learn about friction.

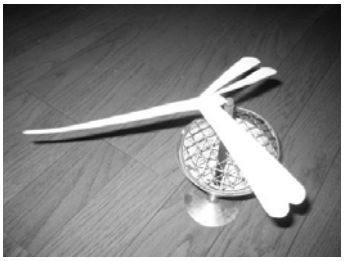

FIGURE 7

FIGURE 8

5.String Telephone -Simple Communication to Network System -

Students may learn through this experiment how sound is transmitted in a substance (FIGURE 9).

FIGURE 9

6.Roget's Jumping Spiral

It is a device showing that the electric current of the same direction attracts it with parallelism each other by each magnetic field (FIGURE 10). This apparatus was devised by Peter Mark Roget (1789-1868), who was a physician.

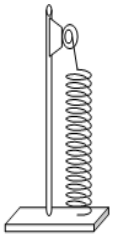

FIGURE 10

FUTURE VIEW

It was good to be able to gather the women who are minorities through our activities. The latest activity is demonstration at "Physics Challenge". Physics Challenge is the domestic competition for Physics Olympics. But, few women students participate on Physics Challenge, as few women staffs support it. The members of LADYCATS had Physics demonstration on Physics Challenge. We hope that people who consent to our activity increase.

REFERENCES

1. Stefan Hildebrandt and Anthony Tromba, *KATACHI NO HOSOKU*, Tokyo Kagaku Dojin (origin: *The Parsimonious Universe: Shape and Form in the Natural World*), 1994.
2. J.J.Griffin & Sons, *Scientific Handicraft*,1910.