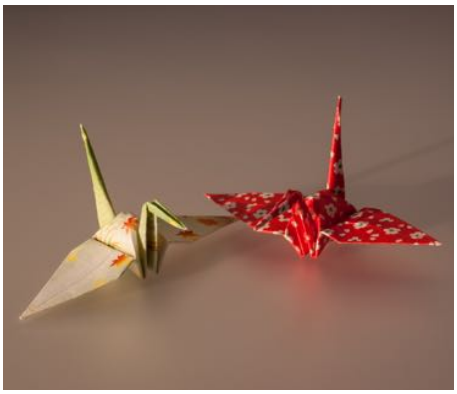


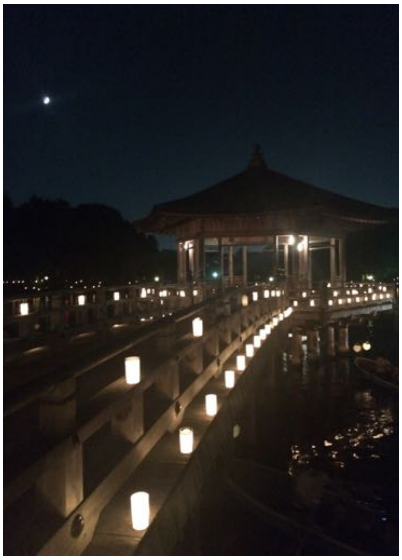
OVERVIEW

Do you know that the world of mathematics can be found in Japanese traditional paper folding, Origami? Does it seem natural for you that the same law of physics holds for the beautiful Moon in space and a bucket of water in the classroom? In this programme, you will immerse yourself in the world of pure mathematics and physics by swinging around a bucket of water or a pendulum and folding Origami in the ancient Japanese capital, Nara, with a warm welcome from friendly deer and the Big Buddha. Let's learn the universal rules together with international friends who have different backgrounds, cultures and languages!

We welcome all female undergraduate students with interest in mathematics and/or physics in general as well as the workshops in the programme even if you have not learned the above subjects at the high-school level. All our workshops involve introductory steps to help non-specialist students to keep up with the programme.

INVISIBLE

How to Make Sense of the Universe with Origami and a Pendulum



SCORE2017
Science Camp of CORE of STEM
Nara Women's University, Japan

Making "INVISIBLE" facts "VISIBLE"

This year's programme provides workshops on mathematics and physics. There exist many facts and miracles in the world which can never be explored without the knowledge of modern science. "Making invisible facts visible" has always been an underlying motive for scientists in their attempts to understand their target issues in scientific way, hence the keynote of our programme this year.

1. Visit to Nishi-Harima Observatory and SPring-8 Electron Accelerator Facility

Nishi-Harima Astronomical Observatory features a 2m “Nayuta" telescope which is sensitive to both IR and visible lights. Besides the observation with Nayuta, you will also operate small telescopes by yourself to see stars. A lecture about dark matter in relation to astronomical observation will also be given. SPring-8 is a laboratory where they operate an 8GeV electron storage ring accelerator that is 1.4km in circumference. The purpose of this machine is to utilize synchrotron radiation lights emitted from the stored beam. The lights extracted at the beam-lines along the stage ring are used to investigate the molecule structure of various materials.

2. Mathematics workshops

A part of mathematics workshop is held right after visiting SPring-8 on the way back to Nara during a 2-day field trip. We will visit a shrine to see "Sangaku", which are mathematical conundrums offered to religious institutions during the 18th or 19th century by people to show off their erudition and challenge others. You will discuss and try to solve them yourself. Another maths workshop will be held at university to study the geometric structure of an Origami crane.

3. Physics workshops

In order to understand the reason why the Moon is in the sky waxing and waning, we will revisit the basic law of nature in both theoretical and experimental approaches. On Day-1 of physics workshops, after an introductory lecture, you will shoot a film of an object in motion in digital format in order to test the equation of motion and the characteristics of circular motion. You will then extract the position and velocity difference on a tablet screen. On Day-2, following a lecture on oscillation to understand the motion of a pendulum, you will perform an experiment using a pendulum to measure the strength of gravity. You will be able to compute Earth mass and the distance to the Moon with your own data. You will be encouraged to propose your own ideas to measure relevant quantities as well.

4. Other activities

There will also be lectures and activities to learn and experience the specialities of Nara. During the trip to Nishi-Harima, you will experience the traditional papermaking at a paper-mill as a prelude to the "Origami" lecture.

WE LOOK FORWARD TO RECEIVING YOUR APPLICATION!