

# HU-ACE NEWS LETTER

Advanced Core for Energetics, Hiroshima University

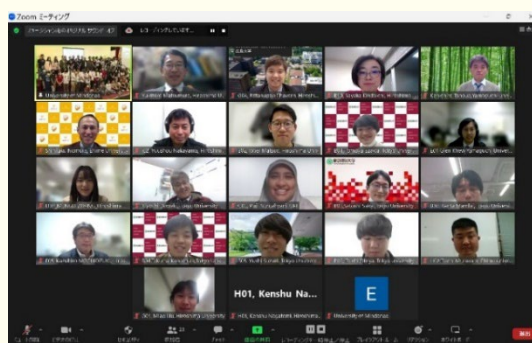
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## Activities of the Core

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| Jan. 3, 2023     | The Chugoku Shimbun introduced Hiroshima University's carbon neutrality and geothermal utilization initiatives.  |
| Jan.4, 2023      | Professor Nakashimada's research on gas fermentation was introduced in "JST News"  |
| Jan. 16, 2023    | The 78th HU-ACE Steering Committee Meeting.<br>The 113th HU-ACE Seminar (The 2nd Geothermal Seminar).  |
| Jan. 17-31, 2023 | Prof. Matsumura held a JICA Subject-Specific Training "Biomass Utilization Technology" Review Seminar.   |
| Jan.20-21, 2023  | The 11th JCREN2022 (co-organized).   |
| Jan. 24-31, 2023 | Assoc. Pro. Kindaichi served as a facilitator for the training of staff in charge of facilities of national university corporations (mid-level class) organized by the Association of National Universities. |
| Jan. 30, 2023    | The 8th Hiroshima University Biomass Premium Evening Seminar (co-organized).   |

## We co-organized the international conference, JCREN

Interdisciplinary collaboration is needed for the energy field, too. Considering this, we organize a Joint Conference on Renewable Energy and Nanotechnology every year. This year, it was held on Jan. 20 and 21, 2023. This conference aims to develop collaborative projects through research presentations from various academic fields, and is held in the order of Japan, Thailand, and followed by other countries. The Philippines were in charge this year, and the Conference Chair was Dr. Chosel Lawagon, Director at Center of Green Nanotechnology Innovations for Environmental Solutions, University of Mindanao, and the conference was held as a hybrid event. On the second day, a tour was made, including a visit to the hydroelectric powerplant. Around 40 presentations from 4 countries were given, with active discussion. From HU-ACE, Dr. Matsumura gave a plenary talk and introduced the Hiroshima Scenario. Presentations were also given by, Dr. Kindaichi and Dr. Mochidzuki.



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# Research Topics

## Development of measurement technology and dosimetry method for environmental radioactivity

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•**Research fields** : Evaluation of radiation dose, Medical and engineering application of radiations

**Keywords**: nuclear disaster, radiation, neutron measurement, dose estimation, ion beam, Dosimetry, radiation dose, Microdosimetry, Neutron



## Abstract

### Background, Methods

We have been developing measurement technologies for radioactivity in the environment and assessing the resulting radiation doses through the following studies: dose evaluation for the atomic bombing of Hiroshima and Nagasaki, an environmental radioactivity survey following the Chernobyl nuclear power plant accident, radiation dose estimation for the JCO criticality accident, radiation dose assessment of residents living near the nuclear test site in Kazakhstan, and radiation contamination and dose evaluation following the Fukushima Daiichi Nuclear Power Plant accident. We have been developing techniques for measuring radioactivity in the environment and assessing radiation doses associated with these techniques.

Currently, we are collecting and analyzing soil samples of the black rain area in order to obtain scientific data on this area. We are also extracting and analyzing melted spherules from Moto-Ujina beach, where Wannier et al. <sup>1)</sup> have reported finding melted spherules originating from the atomic bomb. If these melted spherules can be shown to be of A-bomb origin, the search for similar melted spherules in the ground is expected to provide evidence of fallout from the atomic bombing of Hiroshima, and will provide guidelines for determining the black rainfall area, which could not be confirmed by actual measurement for 77 years after the war.

### Results

To date,  $\gamma$ -ray analysis using a Ge detector of molten particles extracted from sand the sand at Moto-Ujina beach (Fig. 1) has confirmed that the concentrations of uranium and thorium are higher than those in soil. However, there is no conclusive evidence that the molten particles from the Moto-Ujina Beach originated from the A-bomb, and further analysis is needed.

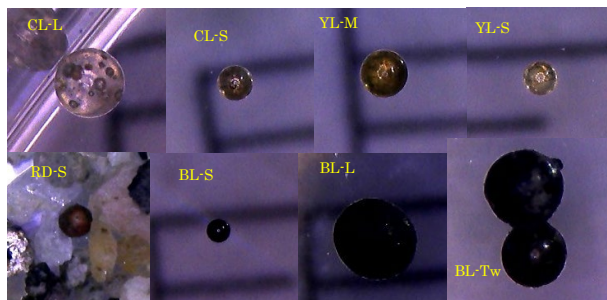


Fig. 1 Melted spherules extracted from sand at Moto-Ujina beach

### References

1. Wannier M.A. M, Urreiztieta M, Wenk H, Stan V. C, Tamura N, Yue B (2019) Fallout melt debris and aerodynamically-shaped glasses in beach sands of Hiroshima Bay, Japan, *Anthropocene* 25, 100196.