

## Report on the 15<sup>th</sup> Japanese-American Frontiers of Science (JAFoS) Symposium

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Although it seems abrupt from the beginning, some people may begin to read this article thinking, “What is the JAFoS symposium? Since a new report was posted, I will take a look at it.” In a word, the JAFoS Symposium is an intercultural and interdisciplinary exchange event for researchers in a unique form organized by the Japan Society for the Promotion of Science (JSPS). While I participated in this symposium, I had a valuable experience of acquiring many friends in different fields of expertise. Besides, I have learned various cutting-edge topics, the ways to conducting research and how to live as a researcher in practice. Therefore, to those who did not have the opportunity to participate in the JAFoS Symposium (rather, it is exactly to such readers), let me report the atmosphere of the symposium. If you are interested in it, I would like to encourage you to participate.

The FoS Symposium is an abbreviation for the Frontiers of Science (FoS) Symposium. According to the JSPS website, “JSPS supports FoS symposiums that provide a platform for talented young researchers (up to 45 years of age) to engage in cross-disciplinary discussions on leading edge scientific topics. The symposiums aim to contribute to the development of new academic disciplines and the fostering of future generations of leaders.” (<http://www.jsps.go.jp/english/e-fos/index.html>) So far, the FoS symposia have been held between the two countries, such as Japan-U.S., Japan-Germany, Japan-France, and Japan-U.K. Among them, the Symposium held between Japan and U.S., that is, the Japanese-American Frontiers of Science (JAFoS) Symposium, is the oldest. It has been held for 15 times by 2016 since it was started in 1998.

The JAFoS Symposium is held for three days with eight sessions covering all fields of natural sciences and social sciences. In each session, after hearing the presentations by three experts on preselected topics, all 40 participants each from Japan and the U.S. have a free discussion (each session is programed with 75 minutes of presentation and 45 minutes of discussion). The participants are the researchers selected from a wide scope that covers every field of natural sciences

and social sciences. However, the qualifications of participants have unique restrictions. They are limited to those under 45 years old who have never participated in the FoS symposium (\*). This is based on the consideration that focuses on young researchers and provides such people the opportunities to participate in, as broadly as possible. The 15<sup>th</sup> JAFoS Symposium was held at the Arnold and Mabel Beckman Center, in Irvine, California, U.S., on 2-4 December, 2016.

I participated in the JAFoS symposium as a chair (later renamed as an introductory speaker) in the 13<sup>th</sup> (2012), as a planning group member (PGM) in the 14<sup>th</sup> (2014), and as a PGM co-chair in this year. (The restriction of participation numbers mentioned above are not posed on PGMs). There are eight PGMs each from Japan and the U.S. They play a role of selecting topics and planning each session. Our activities of PGMs began with the Planning Group meeting at the 14<sup>th</sup> JAFoS Symposium two years ago. Our first task was to gather information on a wide range of topics for which each PGM strongly recommended.

In order to select the topics, the PGM meeting was held in Hawaii in November 2015, one year before the symposium. It was a meeting to finalize the topics by vote after all Japanese and American PGMs hold discussion on the suggested topics in the whole day. It was the most important work as PGMs. In any case, selecting a topic that attracts participants, who have a wide range of background, academic achievements in each field and are able to give an informed judgement, can directly lead to the success of the session. For the PGMs in other fields, I wanted to show them how interesting the topic I was proposing and how important the research field was. At the same time, it was also an important point whether the selected topic was from Japanese side or U.S. side. As a PGM in the “Physics / Astrophysics / Astronomy” session, I recall that I attended this PGM meeting in a much lifted spirit.

Once the topics are confirmed, PGMs in each field select three speakers from two countries who are considered to be appropriate persons to talk about the topic (more precisely, in the formal procedure of the Japanese side, after PGMs recommend several candidate speakers, the finalists are selected by the JSPS FoS Advisory Board.). To secure a speaker, who has both excellent academic achievements on the

selected topic and high presentation skills that can attract the interests of participants in different fields, is also an important mission of a PGM. The process takes several months.

The JAFoS symposium held after these processes is a culmination of PGMs' efforts. Once it has started, they would be anxiously watching over their planned sessions whether they turn out to be exciting enough or not. The eight sessions and topics of this symposium are shown in Table 1 below. I think you can understand that the topics are extremely diverse. All speakers were the leading young researchers in each topic, and the participants could acquire the knowledge of the cutting-edge research by watching and listening to their vivid presentations. Moreover, as there was plenty of time for discussion, participants could ask anything on the spot and any opinion was welcomed.

Apart from the eight sessions, the poster sessions are also scheduled for the participants so as to introduce their research more extensively. It is a pretty hard schedule to carry out in three days; nonetheless, it is a truly invaluable experience for a curious mind.

In fact, we are the most fortunate that we become genuinely excited by listening directly to the researchers of the same generation talking about the cutting-edge topics of the different fields, who are the driving force in each field. The most interesting part of the JAFoS Symposium is primarily in this cross-disciplinary exchange.

|       | Session                                     | Topic  |
|-------|---|--|
| Day 1 | Social Sciences                             | Decision-Making: A Behavioral Economics and Neuroscience Perspective |
|       | Materials Sciences/Biomaterials             | Advanced Manufacturing / 3D printing                                 |
|       | Earth Science/Environment                   | Environmental Archaeology/ Paleoclimate                              |
| Day 2 | Mathematics/Applied Mathematics/Informatics | New Directions in Mathematical Epidemiology                          |

|       |                                    |   |
|-------|------------------------------------|---|
|       | Medical/Neuroscience               | Deep Brain Stimulation and Neuromodulation of Neurodegenerative Disorders |
| Day 3 | Biology/Life Science               | Manipulating the genetic code   |
|       | Physics/Astrophysics/<br>Astronomy | Computational Cosmology: Observation and Theory                           |
|       | Chemistry/Biochemistry             | Good Sleep: Relief from Sleep Disorders                                   |

Table 1: Sessions and topics of the 15<sup>th</sup> JAFoS Symposium

Another attractive point of the symposium is the intercultural exchange. In my private opinion, after participating in the symposium for three times, I have found that the Japanese researchers and the U.S. researchers discuss in slightly different ways, and that difference cannot be explained only by the differences in languages. For example, the American researchers were really verbal. They were full of confidence even in speaking something that occasionally did not make sense. On the other hand, the Japanese researchers generally asked their question briefly, but they were logical and well organized. While both sides have their merits and demerits, the American way of argument might be more tolerant toward original ideas even if they might lack logic and precision. In fact, I was surprised to learn that such a difference applies not only to the physics field to which I belong, but also to other fields. Needless to say, it is crucially important for Japanese researchers to experience the difference that could be felt from such a “national character” when actively engaging internationally, since science is conducted in the whole world.

Thus, I really enjoyed the JAFoS symposium most probably in the same way as almost all participants did. As mentioned earlier, this symposium has already been held for nearly 20 years and it is a wonderful program perfected with the established format.

Considering the future, however, there are some problems. What was regrettable in this 15<sup>th</sup> JAFoS was that the number of U.S. participants was less than 30 people against the capacity of 40 people, whereas there was no fault at all on the Japanese side. The attendance with the equal number of participants was important because an exchange between Japan and the U.S. was a major objective of the symposium

Such imbalance had never happened other than this time since we had the U.S. participants of full capacity in the case of the 14<sup>th</sup> symposium held in Japan two years ago. In any case, it goes without saying that not only the mutual trust but also the moderate tension should be present between the two countries in such international exchanges.

I would like to express my gratitude to the Japan Society for the Promotion of Science (JSPS) that has carried out such a wonderful program over the years, and to Ms. Ayaka Sasagawa, Ms. Sachiko Kawakami, and Ms. Shiho Hayashida, who worked hard for arranging the symposium. Although the international exchange is not likely to produce a result on the spot, the FoS Symposium is definitely an important project that can be carried out only by the organization such as JSPS, and would contribute to the development of academic achievement in Japan. It is also a valuable opportunity to enhance the international presence of Japanese researchers beyond the boundaries of the fields.

In addition, I would like to extend my appreciation to Professor Hiroki Arimura, Professor Yoshihiro Kubo and Professor Mio Murao in charge of the JAFoS at the JSPS FoS Symposium Advisory Board, who encouraged and supported us in various events, such as the Japan-US PGM meeting and the symposium.

I thank Dr. Edward Patte and Ms. Danielle Crosser of the U.S. National Academy of Sciences who hosted the symposium, and the American PGMs chaired by Dr. Jacob Hooker for their warm hospitality and support.

Finally, I would like to thank Professors Kazuhiro Maeshima, Miya Ishihara, Chika Minejima, Shinya Yoshioka, Junichi Yamagishi, Masaru Ishii, and Hisaki Kono, who worked together for the symposium as planning group members. I was blessed to share a wonderful experience with every one of you by getting involved in the JAFoS symposium. It is my great fortune. Thank you so much.

If you read this report and get interested in the FoS Symposium, I would like to encourage you to participate without hesitation. You can expand your knowledge to the different fields and cultures through extraordinary academic experiences that cannot be obtained in ordinary research activities. I believe it should be useful for

your own research.

\* Please note that the selection criteria for participants have been partially changed from the FY2017 FoS Symposium onwards as follows: An applicant must be 45 years old or less as of 1 April of the fiscal year and 15 years or less after obtaining a doctoral degree. As before, applicants who have not attended the symposium before will be chosen.



<Session Coordination Meeting>



<Session>



<Flash Poster Talks>



<Poster Session>



<Cultural Tour>



<Planning Group Members>



<Group Photo>