

(For JSPS Fellow)

Form B-5

Date (日付) 23/10/2017

(Date/Month/Year: 日/月/年)

Activity Report -Science Dialogue Program-
(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名) Anna Sciazko (ID No. P16779)
- Participating school (学校名): Ichikawa Senior and Junior High School
- Date (実施日時): 13/10/2017 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): (in English) Fuel Cell in the Future Energy Market
(in Japanese) 将来のエネルギー市場における燃料電池

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

My lecture delivered for the students of Ichikawa Senior and Junior High School was divided for four parts. It included the self-presentation, impressions of my life as scientist, and the main part which was focused on the energy and fuels in general as well as in the context of my research. The lecture was followed by demonstrations and experiments and discussion time.

Firstly I gave the short self-introduction which included information about my background, education and experiences in study abroad. I focused on introducing my country, Poland, in comparison to Japan. I briefly introduced the geography, language, climate and culture. Later I explained why I decided to become a scientist, and I talked why it is important to study English. I also explained why I think the multidisciplinary approach is the key point in the modern science.

In the main scientific part of the lecture I focused on the modern technologies for energy generation. We tried to answer the question, why it is important to develop new energy technologies and we discussed this topic in the correlation to the development of societies and depletion of fossil fuels. The main focus of my current study is Solid Oxide Fuel Cells (SOFC). Therefore, during the lecture, the working principle and possible applications in the future energy market of SOFC were introduced. I talked about the correlation between microstructure of materials used in Fuel Cell and their performance. I have also talked in general about the techniques I am using in my research and about the main goals I would like to achieve. I presented and distributed to students the fuel cells I am fabricating to investigate the influence of microstructure for the performance of SOFC. I also presented some of the results of my research including the 3-D reconstructions of structure of SOFC materials in micro and nano-scale.

The lecture was followed by the experiments. We discussed the different types of fuel cell and students tried to use and provide the fuel for the model of 4-wheel-drive type engine car operated by magnesium-air fuel cell. Later we discussed the working principle.

As one of the focus of my work is to provide the numerical model of SOFC, we discussed also the important principles and basic transport phenomena: mass transfer, heat

transfer, charge transfer and electrochemical reactions mechanism. Two simple experiments were presented to discuss the heat transfer by the mechanism of convection.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 40 min + 20 min of experiment (分), Q&A time (質疑応答時間) 20 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

Presentation: by projector;

Experiments: demonstration of SOFC, fuel cell car, two experiments in heat transfer

◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

The lecture was given mainly in English, but the interpretation in the part of technical explanation was given by accompanying person (especially during the question time)

◆Name and title of accompanied person (同行者 職・氏名)

Dr. Yosuke Komatsu

◆Other note worthy information (その他特筆すべき事項):

I would like to recommend this experience for the JSPS Fellows. Students are very curious and intelligent.

My lecture was very well organized. I am very thankful to Mr. Wataru Okui from Ichikawa Senior and Junior High School for all his cooperation and help with organizing this lecture.

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。):

高校生にわかるように、非常にわかりやすく説明するよう努めている印象を受けた。今回アンナ・シチヨシコ氏のサイエンスダイアログに同行し、本事業は、高校生にとって自身の将来を模索するうえでも有用だったと思える。特に今回同行させていただいた市川高校は科学教育に特に力を入れており、講義後も学生から多くの質問を受けていたことからもうかがうことができた。