

様式 A-1  
(FY2024)

2024 年 12 月 16 日

## サイエンス・ダイアログ 実施報告書

1. 学校名・実施責任者氏名: 兵庫県立川西緑台高等学校 ・ 仲川奈緒、山本和也
2. 講師氏名: Dr. Chien Yu CHEN
3. 講義補助者氏名:
4. 実施日時: 2024 年 12 月 16 日 ( 月 ) 11 : 10 ~ 12 : 20
5. 参加生徒: 1 年生 37 人、 2 年生 1 人、 3 年生 1 人 (合計 39 人)  
備考: (例: 理数科の生徒) 総合理数コースの生徒
6. 講義題目: Next-Generation Solar Technology: Perovskite Solar Cells
7. 講義概要: My current research focuses on next generation solar cells, especially perovskite solar cells.  
Compared with traditional silicon solar cells, these next-generation solar cells are cheaper and much easier to make. They are also very thin and light weight. These properties make them suitable for use in places where traditional silicon solar cells cannot be used. In this lecture, I will briefly explain: (1) what solar cells are, (2) the basic properties of perovskite and how they are fabricated, and (3) the research in our group.  
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8. 講義形式:  
☒対面 ・ ☐オンライン (どちらか選択ください。)  
1) 講義時間 45 分 質疑応答時間 20 分  
2) 講義方法 (例: プロジェクター使用による講義、実験・実習の有無など)  
プロジェクター使用による講義  
3) 事前学習  
☒有 ・ ☐無 (どちらかに○をしてください。)  
使用教材 講師よりいただいた、事前学習単語やウェブサイトのリスト。講義内容の要約文
9. その他特筆すべき事項:

Form B-2  
(FY2024)  
Must be typed

Date (日付)  
19/12/2024 (Date/Month/Year: 日/月/年)

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

- Fellow's name (講師氏名): Chien-Yu CHEN (ID No. P24040)
- Name and title of the lecture assistant (講義補助者の職・氏名)  
none
- Participating school (学校名): 兵庫県立川西緑台高等学校(兵庫県川西市)
- Date (実施日時): 16/12/2024 (Date/Month/Year: 日/月/年)
- Lecture title (講義題目):  
Next-Generation Solar Technology: Perovskite Solar Cells
- Lecture format (講義形式):  
◆ ☒ Onsite ・ ☐ Online (Please choose one.)(対面 ・ オンライン)((どちらか選択ください。))  
◆ Lecture time (講義時間) 40 min (分), Q&A time (質疑応答時間) 25 min (分)  
◆ Lecture style (ex.: used projector, conducted experiments)  
(講義方法 (例: プロジェクター使用による講義、実験・実習の有無など))  
Powerpoint slides + projector
- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

The purpose of this lecture is to help the students understand solar technologies. This lecture is the first time that the students have a science dialogue in English. To help the first-grade senior high school students understand, I tried to talk using simple English and provided Japanese translation in slides when needed.

First, I introduced myself and my hometown to the students. Next, to help the students understand why humans need to use solar cells, I discussed the global energy demand and the difference among various energy technologies. Then, I explained what solar cells are and highlighted three of the most important parameters of solar cells: efficiency, cost, and lifespan. Subsequently, I described how traditional silicon solar cells are made and their strengths and weaknesses. I then introduced organic solar cells and perovskite solar cells, which are considered promising next-generation solar cells. I briefly discussed the history of organic semiconductors and halide perovskites, as well as how their materials and films can be made. Lastly, I showed examples of where solar cells can be used and explained situations in which organic solar cells and perovskite solar cells are better options than silicon solar cells. At the end of the lecture, I

encouraged the students to think independently and learn how to use the tools and resources available to them, no matter what career or work they choose to pursue in the future.




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

- Impressions and comments from the lecture assistant（講義補助者の方から、本プログラムに対する意見・感想等がありましたら、お願いいたします。）:






**Other Applications of Solar Cells**

Clothes	Vehicle	Space
		

**Indoor low-power applications**

- Indoor lighting
  - Light intensity: 1000 Luxes weaker than sun light
  - Performance of solar cells in indoor:
    - o-silicon = low efficiency (~10%)
    - Organic = high efficiency (~30%)
    - Perovskite = high efficiency (~30%)

**Intensity**



Wavelength

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