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（学校用）

様式 A-1

(FY2025)

2026 年　3 月　12 日

サイエンス・ダイアログ　実施報告書

1. 学校名: 和歌山県立向陽高等学校

2. 講師氏名: Dr. Lukas Fischer

3. 講義補助者氏名: 川崎猛史　准教授

4. 実施日時: 2026 年　3 月　12 日（木）　14:10　～　16:00

5. 参加生徒: 1 年生　0 人、　2 年生　110 人、　3 年生　0 人（合計 110 人）
   備考:（例:理数科の生徒）

6. 講義題目: What makes a glass a glass?

7. 講義概要:
   本講義の前半では、最初に先生の出身国であるドイツの歴史や文化について話された。講義の後半では、古くから存在しながらも未だ謎の多い「ガラス」について講義された。ガラスはミクロレベルで観察すると液体のように無秩序であるが、マクロな視点では固体として振る舞った。なぜこのような性質の違いが生まれるのかという疑問に対し、AI を用いて解明を目指す研究の背景と観察結果について Q&A を交えて行った。

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　70 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）
      プロジェクターによる講義

   3) 事前学習
      ☑有 ・□ 無 （どちらか選択ください。）
      使用教材: 本校教員が作成したプリント（講師への事前アンケートの内容をもとに作成）

9. その他特筆すべき事項:

For Web posting

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Form B-2
(FY2025)
Must be typed

Date（日付） 27/03/2026
（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）: Lukas Fischer（ID No. P25035）
- Name and title of the lecture assistant（講義補助者の職・氏名）
Prof. Takeshi Kawasaki
- Participating school（学校名）: Wakayama Prefectural Koyo High School
- Date （実施日時）: 12/03/2026（Date/Month/Year:日/月/年）
- Lecture title（講義題目）:
Part I: Germany & me
Part II: Glass: A special kind of solid
- 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）65 min（分）, Q&A time（質疑応答時間）20 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 presentation
- Lecture summary（講義概要）:
In the first part, my lecture gave an introduction into my background. As I am from Germany, it presented some basic information about Germany, such as location, population and size. Afterward, I talked about the German history and culture. I also presented about my school and University experience in Germany as well as about how I came to Japan. In all cases, I made sure to add appropriate comparisons to Japan. The first part concluded with a Q&A session with the students. In a small break afterward, I discussed individual questions that the students (or groups of students) asked me.
In the second part, I then introduced my research. Here, I first started from the concept of the three phases of matter that are already familiar to the students (crystal, liquid, gas). As my research concerns glasses, I then contrasted the state of supercooled liquid as well as glass to the three states of matter discussed previously. To explain these differences, I explained the significance of the viscosity, a physical quantity that measures the resistance of a liquid to flow. I continued by explaining how the viscosity of glasses, supercooled liquids and normal liquids is very different from each other. I also explained about the "Dynamical heterogeneity", an observation related to the differences in viscosities of glasses, liquids, and supercooled liquids.
The main part of my presentation then concerned the introduction of an Artificial Intelligence (AI)/ Machine Learning (ML) method that I want to use to help us distinguish glasses and liquids from a static snapshot alone (only using a "picture", not a "movie" of the system). This task is quite challenging as both are quite similar to each other on a microscopic level. For that purpose, I first explained how ML methods can distinguish cats and dogs, before applying it to the distinction of

glassy and liquid systems. Here, I did not only mention the previous research in that direction, but also my future tasks that I want to work on as part of my JSPS fellowship.
Finally, I concluded by introducing the different types of glass that are present in our daily life ("glass" as a state of matter is not only the "glass" in windows but can be found in many other realizations). Moreover, I mentioned how my research is quite interdisciplinary, connecting the domains of Physics, Chemistry and Information science. I finished with a summary of my presentation.

◆Other noteworthy information（その他特筆すべき事項）:
The lecture was divided into two parts, as detailed above. The first part was about 30 mins, plus a public Q&A of about 20 mins.
The second part was about 35 mins, with some questions in between. After this part, some individual questions about my research were answered by my lecture assistant and me.

- 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。）: N/A