

様式 A-1  
(FY2024)

年 月 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: 愛知県立刈谷高等学校 石川梓
2. 講師氏名: Dr. S. Maity
3. 講義補助者氏名: \_\_\_\_\_
4. 実施日時: 2024年 7 月 5 日 (金) 16:00 ~ 18:00
5. 参加生徒: 1 年生 9人、 2 年生 8人、 3 年生 0 人 (合計 17人)  
備考: (例:理数科の生徒)
6. 講義題目: ナノマテリアルについて
7. 講義概要:  
インドの文化や講師の研究者になるまでの道のり、ナノテクノロジーの基礎的な話から最新のナノテクノロジーの応用についてまで。
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 90 分 質疑応答時間 30 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  
☒ (資料を配布して各自事前学習) ・ 無 (どちらかに○をしてください。)  
使用教材 講師から事前にいただいたウェブサイトの一部抜粋、化学資料集の参考ページ
9. その他特筆すべき事項:  
  
特になし

Form B-2  
(FY2024)  
Must be typed

Date (日付) 10/07/2024  
(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): Subarna Maity (ID No. P23334)

- Name and title of the lecture assistant (講義補助者の職・氏名) N/A

- Participating school (学校名): Aichi Prefectural Kariya High School

- Date (実施日時): 05/07/2024 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目): The World of Nano: Small is Interesting

- 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) 50 min (分), Q&A time (質疑応答時間) 50 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))

Through powerpoint presentation using projector

- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

My lecture was about the interesting facts, daily usage and future applications of nanomaterials. As introduction, I presented my educational background and research career and talked about my home country India, its natural and cultural diversity. Then, I explained the definition of 'nanomaterial' and a historical perspective of the evolution of nanoscience including the ancient Lycurgus cup made of dichroic glass and discovery of electron microscope. The first chemical synthesis of gold nanoparticle performed by Michael Faraday was explained with easy visuals. As the size emerges in nano-regime, the properties of the nanoparticles becomes strongly dependent on size. So, the variation in the colour of gold nanoparticles with size and its reason was explained. To ignite the interest of the students, I presented the electron microscopic images of anisotropic nanoparticles with triangular, rod, pyramid, cubic and star shape. The latest developement in this field is the Nobel prize in chemistry in 2023 which was awarded for the discovery of quantum dots. So, the speciality of quantum dots and size dependent photoluminescence (in terms of light energy conversion) were explained. As the potential applications of nanomaterials, commercialization of quantum dot LEDs, photothermal therapy to kill cancer cells (light to heat conversion) and water purification with nanomaterials were

discussed. Finally, I represented the digital photographs of photoluminescent (red, green and blue color) gold and copper nanoparticles and microscopic images of rod-shaped gold particles, which I have synthesized during my research life. I emphasized the importance of cultural exchange and travel beyond the international boundary to be researcher with enjoyable life.

During discussion, the students asked several questions mostly about the origin of size effect on the properties of nanomaterials and its origin. I was very happy that one of the student asked if the nanomaterials can transform the heat energy to electric energy. They showed a great deal of interest in nanoscience and also asked about the University of Tokyo.

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

The students are very enthusiastic and interacted positively after the lecture. Some of them approached and exchanged contact to keep in touch in future. I will be happy to assist them in any future instance.

- 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