

様式 A-1
(FY2024)

2025 年 3 月 5 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: 原 尚志
2. 講師氏名: Dr.Sanjay Mandal
3. 講義補助者氏名: なし
4. 実施日時: 2025 年 2 月 27 日 (木) 14:05 ~ 15:55
5. 参加生徒: 2 年生 38 人、 1 年生 0 人、 3 年生 0 人 (合計 38 人)
備考: (例: 理数科の生徒) 2 年生SSHクラス
6. 講義題目: Discovering the Rich Tapestry of India / The Universe, Gravity, and the Mystery of Dark Energy
7. 講義概要: インドの紹介および宇宙論の理論的研究について
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 50 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と質疑応答
 - 3) 事前学習
☒ 有 ・ ☐ 無 (どちらかに○をしてください。)
使用教材 講義資料、タブレットを使用して専門用語などの下調べ
9. その他特筆すべき事項:
いつも大変お世話になっております。本校のような地方の学校では、生徒が接触できる外国人は決して多くなく、Science Dialogue はとても貴重な機会となっています。今後ともどうぞよろしくお願いいたします。

Form B-2
(FY2024)
Must be typed

Date (日付) 28/02/2025
(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): Sanjay MANDAL (ID No. P24026)

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

Mr. Usman JAFAR

- Participating school (学校名): Asaka High School, Koriyama city, Fukushima

- Date (実施日時): 27/02/2025 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目):

1. Discovering the Rich Tapestry of India
2. The Universe, Gravity, and the Mystery of Dark Energy

- 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) 30 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))

used projector

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

About India: During the discussion, I shared insights about India, highlighting its rich scientific heritage, technological advancements, and contributions to space research, such as ISRO's Chandrayaan and Mangalyaan missions. I also talked about India's diverse culture, education system, and the importance of science and innovation in the country's development. The students were curious about India's role in global research collaborations and how young scientists can contribute to future discoveries. It was a great exchange of ideas, and I enjoyed answering their questions about India's scientific and cultural landscape.

About Research: We begin by exploring how distances are measured, from roads to the universe. **Parallax** helps measure nearby stars, while **standard candles** like Cepheid variables and supernovae determine greater distances. **Redshift** shows that galaxies are moving away, proving the universe is expanding.

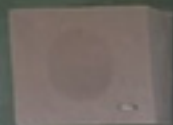
Gravity was first explained by **Newton**, who saw it as a force pulling objects together. **Einstein** later revolutionized this idea with **General Relativity**, showing that massive objects warp space-time, bending light and influencing motion.

The discovery of the **expanding universe** by Edwin Hubble led to the Big Bang theory. However, scientists later found that expansion is **accelerating**, not slowing down. This led to the biggest mystery in modern physics—**dark energy**, an unknown force making up 70% of the universe.

Finally, we discuss the **metric of space-time**, a mathematical tool used in relativity to measure cosmic distances. Understanding the universe's structure and expansion remains an open question, and future discoveries may redefine our knowledge of gravity and dark energy.

◆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。）: The lecture was engaging and well-structured, making complex astrophysics concepts accessible and inspiring. Your passion for research, particularly in dark energy and gravity, captivated the students. The discussion on India's scientific advancements, including ISRO's achievements, sparked curiosity and led to thoughtful questions. Your interactive approach encouraged participation, making the session dynamic and insightful. The students appreciated learning about global research collaborations and the importance of STEM careers. Overall, the lecture was a great blend of scientific knowledge and personal experience, leaving a positive impact on the audience.



Discovering the Rich Tapestry of India

Embark on a fascinating journey through India's geography, history, culture, economy, and modern advancements, tailored for young minds eager to

Sanghy Mandal
Fukuoka University, Japan

