

(For JSPS Fellow)

Form B-5

Date (日付)

(Date/Month/Year: 15 日/01 月/2018 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):

Marco Tulio Coelho Quintino _____ (ID No. P16769 _____)

- Participating school (学校名): TAKEZONO high school

- Date (実施日時): _____ (Date/Month/Year: 05 日/12 月/2017 年)

- Lecture title (講演題目):

What do you mean by random?
Randomness, Quantum Mechanics, and (Non)-Locality.

- Name and title of your company (同行者 職・氏名):

The University of Tokyo

- Lecture format (講演形式):

◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 40 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))

I have used a projector to present some previously prepared slides and a black board. There was also a cooperative team game that students have played to understand better the concepts involved in the talk. Everytime they have won the game, they were presented with a Brazilian snack.

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

I will reproduce here the abstract I have used for the lecture.

ABSTRACT: In this lecture we are going to discuss probabilistic events that we observe in daily life and nature and why randomness is a fundamental concept on quantum mechanics. We will also discuss the concept of "speed of information" via questions like "how fast two distant parts can communicate?".

We will start this lecture by playing a probabilistic game (known as the CHSH game) involving random coin flipping in which two students should cooperate to win a special prize. This game will conduct our discussions on the role of randomness in nature, how quantum mechanics can be used perform better in this game, and how randomness is fundamental for some tasks we

have in our society today.

We will finish the talk by discussing the meaning of quantum Bell nonlocality, what will allow us to have some flavour on the power and particularities of quantum mechanics and also how research and science is done in our current society.

- Overall advice or comments to future participants in the program (今後の講師へのアドバイス):

I believe it was very useful to write some key concepts in Japanese on the slides. That can help the students to follow the lecture and make them feel more familiar. I also think it is useful to encourage the students to ask questions during the presentation and not only in the end to keep them motivated and focused during the whole talk.

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

- Impressions and opinions from a company (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。)

All TAKEZONO high school members were very kind and professional the whole time, helping me with everything they could. I could not imagine a better reception.