

(For JSPS Fellow)

Form B-2  
(FY2018)

Date (日付)

06/02/2019

(Date/Month/Year: 日/月/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): MARTINEZ CALDERON Claudia Maria (ID No. P17030 )

- Participating school (学校名): Yokote Seiryō Gakuin Senior High School

- Date (実施日時): 05/02/2019 (Date/Month/Year: 日/月/年)

- Lecture title (講演題目): Plasma waves in space: what's behind the aurora?

- Name and title of your accompanying person (講義補助者 職・氏名)

Professor · KATOH Yuto

- Lecture format (講演形式):

◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 10 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))

Presentation using projector

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

**Earth is protected from the particles and fields in space by its own magnetic field, also called the geomagnetic field. The solar wind, carries charged particles, electrons and protons, emitted at high speeds by the Sun. The geomagnetic field, acts like a magnetic shield, similar to a bubble called the Magnetosphere, that protects us by deflecting most of the solar wind. Some of those particles manage to penetrate the shield and are trapped in the radiation belts. These highly energetic particles have extreme levels of radiation that are harmful for life on Earth.**

**Extremely Low (ELF) and Very Low (VLF) frequency radio emissions are whistler mode waves in the 3 Hz to 30 kHz range. They are also naturally present in the Earth's magnetosphere. As one of the most common of naturally occurring plasma waves, they have been observed on the ground since the early 1950's. We give them different names depending on their features. For example, incoherent waves are called 'hiss' and discrete waves are known as 'chorus'. These types of waves propagate in the magnetosphere and encounter electrons and ions trapped in the radiation belts. Through wave-particle interactions they can exchange energy with the particles, making the more energetic. They**

can also change their trajectory and making them precipitate into the atmosphere. These precipitating particles produce the famous aurora.

**My work as a researcher at Tohoku University is to try to understand more about these types of waves and their interactions with particles. To do this, I work with the detection of waves and particles on the ground and in space. We want to understand how the changes of solar wind conditions affects the generation of waves and their propagation. We also study how the waves interact with particles and space and how this affects the aurora.**

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

**I would recommend to focus on making the students understand the basic principles of their research, and not every detail behind it. Connecting your research to their daily lives might also make it easier for them to relate to it. I think it's important to leave the students with a positive impression of research in general, and for them to want to go look for further information on the topic.**

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

**It's unfortunate that I did not have more time to interact with the students. I had a few of them stop me on the way out to ask more questions. Maybe the official Q&A session was a little more intimidating for them, so perhaps talking with them in smaller groups afterwards might have been preferable.**

- Impressions and comments from the accompanying person (講義補助者の方から、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。)

**We were extremely impressed by the students' sincere attitude for the lecture and their many interesting questions. Perhaps the accompanying person can take a further role in coordination of the logistics issues (scheduling and transportation, for example).**