

(For JSPS Fellow)

Form B-5

Date (日付) 16/07/2013
(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): Beaucamp, Anthony (ID No. P25-03056)
- Participating school (学校名): 石川県立七尾高等学校
- Date (実施日時): 2:10pm~4:00pm 11/07/2013 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): (in English) Optics Manufacturing in the 21st Century
(in Japanese) 21世紀の光学素子の作り方

- Lecture summary (講演概要):

Optics is a very old branch of science, which was pioneered by the ancient Greeks (such as Euclid), and then more deeply studied during the European renaissance (by scientists like Kepler and Newton). But as an industry, optics "boomed" during the 20th century as it enabled many new technologies to emerge (photography, microscopy, astrophysics, lasers, fiber optics, the internet...). Without optics, much of modern technology would never have been possible! And now in the 21st century, Japan is a world leader in the manufacture of ultra precise optics. In this lecture, the students were taught 4 subjects:

- (1) About the history of discoveries in optics (from Antiquity to the 21st century).
- (2) About the basic principles of optics (such as light reflection and refraction).
- (3) About the fabrication methods used to make mirrors and lenses (including videos showing the use of modern computer controlled machines at Chubu University).
- (4) About the application of optics to X-ray astronomy (which allows the study of supernova explosions and black hole radiation).

Before and during the lecture, students were also shown how to make and align their own reflecting telescope (based on Newton's design), to watch the night sky by themselves.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 110 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))

Used projector presentation, black board for answering questions

◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

For the main part, the presentation was given in English with some Japanese explanations by myself when the students could not understand. Extra assistance was provided

by the accompanying person, to translate difficult technical words.

◆Name and title of accompanied person (同行者 職・氏名)

Prof. Yoshiharu Namba, Chubu University

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

Two weeks before the visit, the students and local teacher were provided with intructions to make a telescope using kits that were provided to them. They brought the assembled telescopes to the school during the visit day, so that I could check the optical alignment and ensure each telescope produced a clear image.

- Impressions and opinions from accompanied person (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。):

授業の 10 日前に紙製のニュートン望遠鏡のキットと説明書(英文)を送り、授業までに製作することを依頼したが、参加した学生全員がこの宿題を完全に実施してきた。また、高校生に対しては授業時間が長かったが、授業中の受講態度も大変立派であり、感銘した。地域性があるのか学生はシャイであるが、英語での質問に適格に対応しており、英語のリスニング能力も平均的な大学生よりは高いとの印象を受けた。高校全体で躰が良い生徒達であり、授業も気持良く実施できた。授業内容が盛り沢山であり過ぎる感はありますが、高校生の評価が良いのであれば、今後とも本事業に協力し、外国人特別研究員を派遣したいと思います。

授業時間以外に学生が望遠鏡製作を通じて英語に触れることができた点は、学生に取り貴重なな経験になったと思います。

国際的に活躍できる次世代の若者を養成するために本事業は大変有効であると感じました。同じ学生に年数回の同様な経験を与えることができれば、より効果があると確信します。