

**Form B-2**  
**(FY2022)**  
**Must be typed**

Date (日付)  
18/12/2022 (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) : Mehrdad Shahmohammadi Beni  
(ID No. P21103)

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

Professor Hiroshi Watabe

- Participating school (学校名): Akita Prefectural Yokote High School

- Date (実施日時): 07/12/2022 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目):

Why Physics? Seeing the invisible

- 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) 90 min (分), Q&A time (質疑応答時間) 15-20 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, used blackboard, conducted simple radiation detection experiment, demonstrated 3D printed phantoms used in our experiments, demonstrated lead shielding materials

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

The entire concept of physics is based on explaining the origin of creation and everyday phenomena that we observe in everyday life. Physics has numerous branches and in the present lecture we have focused on the nuclear radiation physics. The nuclear radiation or as generally called ionizing radiation is invisible to human eye yet it has the ability to have detrimental effect on our health, if it is being emitted uncontrollably. However, in most cases the use of ionizing radiations in a controlled fashion would be beneficial to human wellbeing in battle against cancer. In this case, the concepts of physics would be needed to achieve such control over ionizing radiations and that is when the nuclear radiation physics comes into the spotlight. In some cases such as nuclear power plant severe accidents or realistic organs based dosimetry, experimentation would rather be tedious. Therefore, the computational radiation physics would be employed to model the radiation transport and interaction with matter. This clearly

demonstrates the complementary nature of physics and its connection with different branches of science. In the lecture, we have demonstrated number of important works from our research in Japan and its impact to further enhance the understanding of radiation interaction, shielding and dosimetry.

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

The most important part of research work that we introduced to the students would be simplification of the developed solution to a specific problem, as this would be important for other scientists to use our findings to further enhance the existing technology or develop new technologies for a specific problem.

- Impressions and comments from the lecture assistant (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。):

たいへん貴重な機会をいただき、ありがとうございました。外国人特別研究員と高校生との交流はたいへん良い試みだと思います。研究員本人はもとより、ホストである東北大学の良い PR になりました。高校生にとっても、最新の研究を聴けるまたとない時間となったことと存じます。いささか残念だったのが、交流の時間が短かったことでしょうか。日本人は一般的に恥ずかしがりやですので、自分から質問できる学生はごく一部です。ダイアログの時間を設けて、もう少しいろいろな学生と意見交換する時間があってもよかったかもしれません。

東北大学サイクロトロン・ラジオアイソトープセンター 渡部浩司