

Form B-5

Date (日付) 05/11/2015**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) : Shabbir Ahmad Khan (ID No. P 14380)
- Participating school (学校名) : Toyama Prefectural Toyama Senior High School
- Date (実施日時): 28/10/2015
- Lecture title (講演題目) Plasma Science, basic concepts, history and applications
- Lecture summary (講演概要) : Please summary your lecture 200-500 words.

I have divided the lecture in three parts. First, I introduced myself and my country with brief discussion on history, geography, culture and landscape of Pakistan. Then I discussed about my research experience in past and present, motivation for research, my research group and life in Kyoto .

In second part, I discussed the basic ideas of plasma science, its brief history and various applications in technology. The link of this inter-disciplinary science with other fields is also highlighted. One of the major applications of plasma physics is in magnetic confinement of plasmas for nuclear fusion. The application of plasmas in fusion science and its potential in future energy production is discussed in detail. Heating of a plasma to very high temperature is basic need of controlled fusion reaction. Various methods of heating of fusion plasmas are discussed.

In last part of the lecture, I discussed our research results based on the kinetic integrated modeling of wave-plasma resonant interaction and power absorption in an inhomogeneous plasma. In this work, we have performed the full wave analysis of the problem via the TASK/WI code using finite element method. Power absorption rate under various conditions of nonuniform density, temperature and injection angle is computed and compared with previous results. It was shown that the results are in good agreement to the previous results of fluid model analysis for incidence angle dependence. The lecture should provide the students the scope of plasma science and the potential of magnetic confinement fusion for solution of future energy problem.

- Language used (使用言語) : English
- Lecture format (講演形式) :
 - ◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 20 min (分)
 - ◆Lecture style (ex.: used projector, conducted experiments): Used Projector
 - ◆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))
Accompanied person
 - ◆Name and title of accompanied person (同行者 職・氏名) Professor Atsushi Fukuyama
 - ◆Other note worthy information (その他特筆すべき事項) : No
- 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。) : The lecture was useful for the students and inspiring experience for the lecturer. A translation table of some basic technical terms might have been beneficial for understanding research activities.