

(For JSPS Fellow)

Form B-5

Date (日付)

_____ (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): Miklos Lajko (ID No. P13802)
- Participating school (学校名): Komaba Junior & Senior High School at Komaba, University of Tsukuba
- Date (実施日時): 27/06/2015 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): (in English) Introduction to Monte Carlo algorithms, numerical methods using randomness

(in Japanese)

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

Condensed matter physics deals with the properties of solid or liquid materials, where the presence of a lot of particles plays an important role. In solids the ion cores are in an ordered crystal structure (lattice). If the electrons can move between the ions we talk about conductors. However, in some cases the electrons are localized to the ion cores, therefore the system is insulating. In these systems the intrinsic magnetic moments (so-called spin) of the electrons play an important role.

Such systems can be imagined as small compasses at every site of a lattice. The orientation of these compasses depend on the orientation of their neighbours. If the neighboring compasses prefer to stay parallel we speak about ferromagnetic interaction, while if they prefer anti-parallel orientation the interaction is antiferromagnetic. Thesesystems can show a wide variety of behavior depending on the lattice or the type of the interaction between the compasses.

I described the basics of the so-called Monte Carlo methods, a clever way to study condensed matter systems with the use of random numbers. I introduced the basics of random numbers and the idea of Monte Carlo methods through simple examples of coin toss, dice throwing and darts. I show how these methods can be applied for systems with localized magnetic moments.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 75 min (分), Q&A time (質疑応答時間) 15 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 used a projector for the presentation, and a whiteboard for clarifying and 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))

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

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

- 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。):