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（For JSPS Fellow）

Form B-5

Date（日付）
27/08/2015 （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）: Zhaoming Tian （ID No. P 14026 ）

- Participating school（学校名）: Yoshida Senior High School

- Date （実施日時）: 27/08/2015 （Date/Month/Year:日/月/年）

- Lecture title（講演題目）: （in English） Introduction of Metal-Insulator transition, related Materials and Experimental Phenomena

（in Japanese）

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

Firstly, The chinese traditional culture and related information of high school education was introduced. Then, I introduce the reason why I come to Tokyo university of Japan and continue my living as a reseacher of material physics.

My research work in institute of solid state physics of Tokyo university is introduced, including the experimental procedure to synthsis the single crystal, measurement of resistivity and magnetism. The reseach history of metal-insulator transition was introduced, related applications in our living is also introduced to the students. The related material examples showing the metal-insulator transition was introduced incluing paramagnetic-ferromagnetic transition, electron-related iridates.

The metal-insulator (MI) transition is a hallmark phenomenon due to strong correlation in solids. As for our reseach in ISSP of Tokyo university, Nd2Ir2O7 single crystal as one of example exhibiting MI transition. I report the discovery of a quantum insulator-metal transition tuned by a field of ~ 10 T, whose magnetoresistance exceeds 80,000%. We show this material can show anisotropic magnetoresistance and the field induced metal insulator transition only for fields near the [001] axis. The strong sensitivity to the field direction is remarkable for a cubic crystal, as is the fact that the MIT can be driven by such a small magnetic field. The related physical mechanism is introduced.

- Language used（使用言語）: English

- Lecture format（講演形式）:

◆Lecture time（講演時間） 70 min（分）, Q&A time（質疑応答時間）80 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））

Must be typed

Used projector handouts

◆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））

Handouts explained by Japanese from the Yoshida Senior High School

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

No

◆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。）: