

(For JSPS Fellow)

Form B-5

Date (日付)

14 October 2016 (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): RAHUL KUMAR (ID No. P 15323)- Participating school (学校名): NIRAYAMA HIGH SCHOOL- Date (実施日時): 06 OCTOBER 2016 (Date/Month/Year: 日/月/年)- Lecture title (講演題目): (in English) Can you hear black holes collide and stars explode through gravitational waves?(in Japanese)

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

The year 2016 is very special for science, especially Astrophysics for two main reasons, (a) we are celebrating 100 years of Einstein's General Theory of Relativity which proposed the existence of gravitational waves and (b) gravitational waves was recently discovered by the two LIGO (Laser Interferometer Gravitational wave Observatory) detectors in USA. The detection was made on 14 September 2015 and the announcement of the discovery was made public on 11 Feb 2016. Gravitational waves are ripples in the curvature of space-time fabric of our Universe. According to General Relativity (GR), space-time universe is curved or warped due to the presence of heavenly bodies (like stars, black holes, planets etc). Hence, matter tells space how to curve and space tells matter how to travel. This concept is totally different from Newtonian gravity (Newton's Law of gravity) which believes in instantaneous action or reaction. Gravitational waves are produced in the universe through violent activities like collision of fast rotating stars (binary Neutron stars), binary black holes and supernova explosions. However detecting gravitational waves is extremely difficult because they are very weak in nature and can pass through any object (even our earth, sun or other stars) virtually undetected. Currently there is a global network of detectors around the world to detect gravitational wave signals. There are two LIGO detectors in USA, Virgo detector in Italy, GEO-HF in Germany and KAGRA detector in Japan. There is a third LIGO detector in India which will be operational post 2022. In this lecture, I explained the concepts of General Relativity, Gravitational waves and techniques for their detection. This includes KAGRA detector in Japan which is leading this field and is at the forefront of this cutting edge technology. Around 42 high school students attended my talk. The talk was well understood by the students and this was evident by the quality of questions I was asked by them (for close to 30 mins), which left me really impressed.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 65 min (分), Q&A time (質疑応答時間) 30 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))

Projector and laptop

◆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))

Assistance and Japanese interpretation was provided by accompanied person

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

Dr. Takayuki Tomaru, Associate Professor (KEK)

◆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。):