滞在型研究員報告書（様式２）　　（2008 年 9 月策定）

国立天文台滞在型研究員の方には期間中の成果について報告をしていただくことになっております。このフォームに記していただき期間終了 2 週間以内に国立天文台研究支援係にご提出ください。なおこの報告書は研究成果の論文掲載前でも研究交流委員会の web 上に公開いたしますので、研究内容の詳細について記入していただく必要はありません。この研究の成果を学術誌等で発表するときはその旨を謝辞に記載してください。

2011 年 6 月 28 日

所属　University of Notre Dame, Department of Physics/ Center for Astrophysics
氏名　Grant J. Mathews (Professor)
受け入れ　　氏名：　Prof. T. Kajino
滞在期間　　2011 年 6 月 2 日　～　2011 年 6 月 22 日

I. 滞在型研究員として国立天文台滞在中に行った活動について簡単にお書きください。（Your activity during this stay）：

The activities during this trip involved the development of a number of research projects, including the completion of three manuscripts for submission to journal publication. The specific activities are as follows:

a. Studies of the effects of a time-dependent quark mass on primordial nucleosynthesis.
b. Studies of the effects of a Primordial Magnetic Field on large scale structure and the cosmic microwave background.
c. Studies of a new QHD equation of state for magnetars.
d. Studies of the nucleosynthesis of r-process elements in the collapsar model for GRBs.
e. Studies of evidence for an inverted neutrino mass hierarchy from the new T2K theta13 determination and nu-process nucleosynthsis.
f. Studies of the impact on r-process nucleosyntheis of new measurements of beta-decay lifetimes at the RIKEN RIBF.
g. Studies of the neutrino interaction cross sections for the nu-process nucleosynthesis of 92Nb and 98Tc.

II. 今回滞在型研究員として得られた成果について簡単にお書きください。（Your research products from this stay）：

1. We completed response to referee for manuscript: Mung-Ki Cheoun, Toshitaka Kajino Motohiko Kusakabe and G. J. Mathews,"Time Dependent Quark Masses

and Big Bang Nucleosynthesis Revisited," Submitted to Phys. Rev. D (2011). arXiv:1104.5547v1 [astro-ph.CO]. This paper was resubmitted and accepted for publication during the first week of my stay.

2. A proposal was written and accepted to write a review article on the Primordial Magnetic Field to Physics Report.
3. A paper was completed and submitted on the QHD equation of state for magnetic neutron stars.
4. A paper was written and nearly submitted on the nucleosynthesis of r-process elements in the collapsar model for GRBs.

5. A paper was written and nearly submitted on evidence for an inverted neutrino mass hierarchy from the new T2K theta13 determination and nu-ptocess nucleosynthsis.
6. A paper was written on the impact on r-process nucleosyntheis of new measurements of beta-decay lifetimes at the RIKEN RIBF.
7. A paper was written and nearly submitted on studies of the neutrino interaction cross sections for the nu-process nucleosynthesis of 92Nb and 98Tc.

III. この制度についてなにか御意見がありましたら、なんでも記入ください。
(Any opinions on this exchange program)：

It is always a productive and pleasant scientific exchange to visit NAOJ. This is a healthy research collaboration which has produced a large volume of research over the past 20 years and will continue to do so.