

Activity Report of the NAOJ Visiting Scholar Program

Host Project/Division: Division of Theoretical Astronomy Name of Host Scientist: Eiichiro Kokubo

Name of Visiting Scholar: Edwin L. Turner

Title: Visiting Professor

(Choose the appropriate one)

Period: from 2014/09/04 to 2014/10/31 and from 2015/02/05 to 2015/03/05

I. Report from the visiting scholar

[i] Achievement during the period of stay (in comparison with the initial plan)

(Collaborative Research)

Professor E. Kokubo, Todai graduate student M. Isoe and I have worked in close collaboration on a study of the dynamical structure and stability of exoplanetary systems and their relationship to the system multiplicity (number of planets in the system) using both radial velocity and transit (Kepler Mission) data samples. This effort extends the discovery of a strong anti-correlation of mean/median planetary orbital eccentricities with multiplicity (Limbach & Turner 2015). Additional empirical correlations of dynamical properties such as the system angular momentum deficit and orbital separations in Hill radius units with multiplicity have been revealed; these suggest a connection between dynamical stability and multiplicity that may well prove to be a valuable clue to the formation and early evolution of planetary systems as well as providing a comparison point for numerical simulations. In addition to this effort, I have continued to participate in the SEEDS project (Professor M. Tamura, PI) and the SuMIRe project, a collaboration that involves NAOJ, Princeton and Kavli-IPMU as well as other institutions.

(Education)

During the week of 2015 February 9-13 I presented a mini-course on “Exoplanets and Astrobiology” consisting of four 3-hour lectures, each divided into two 90 parts, to Sokendai and other interested astronomy graduate students plus some members of the NAOJ senior scientific staff.

(Others)

In my role as Director of the Council for International Teaching and Research at Princeton University, I carried out discussions and planning with NAOJ management aimed at further developing Princeton’s institutional collaborations and connections with NINS and its research institutes.

[ii] Any comments on this program
The visiting professorship and associated support that I was so fortunate to receive through this program has been exceptionally valuable to me, both in terms of my personal scientific investigations and as a participant in major institutional collaborative projects. It is an excellent program for advancing science and for the further internationalization of the world's scientific activities.
[iii] List of publications and presentations by the visiting scholar in collaboration with NAOJ staff or graduate students
Isoe, M, Kokubo, E., and Turner, E. L., Multiplicity and Dynamical Structure of Planetary Systems, Annual Meeting of Astronomical Society of Japan, 2015.3.18-21

II. 以下の項目について、受入教員が記入してください。

Report from the host scientist

[iv] 本制度に対する意見、要望など Any comments on this program
特にありません。