## 山田シンポジウム援助一覧表

| 主催責任者 | 集会 | 会期 | 開催地 |
|---|---|---|---|
| 放送大学教授<br>東京工業大学名誉教授<br>星　元紀 | YS3 - From Chaos to Cosmos:<br>Integration in Biological Systems | 2007<br>11/17～11/22 | 湘南国際村 |

1件　援助金　8,010,000円

## 成果報告

### 山田シンポジウム 3：“From Chaos to Cosmos: Integration in Biological Systems”

2007 年 11 月 17 日～ 21 日　於　湘南国際村センター

組織委員長　放送大学　星　元紀

山田科学振興財団の創立 25 周年を機に創設された山田シンポジウムは、「次世代を担う研究者に広い視野と先見を与え、研究の将来を胚胎すること」を目的としている。すでに、第 1 回 “Neutrinos and Dark Matter in Nuclear Physics”（2003 年 6 月、奈良）、第 2 回 “Key Natural Molecules in Biological Systems”（2005 年 9 月、淡路島）が行われているが、これらをうけて第 3 回（YS-3）として “From Chaos to Cosmos: Integration in Biological Systems” が、2007 年 11 月に相模湾の先に富士山を望む湘南国際村で開催された。ここにその概略を報告する。

#### Opening Address


星組織委員長

Distinguished Guests, Dear Colleagues, Ladies and Gentlemen,

It is my great privilege and honor to welcome you all to YS-3 “From Chaos to Cosmos: Integration in Biological Systems” on behalf of the organizing committee. This symposium is the third one of the serial symposia under the common title of “Yamada Symposium” which was initiated on the occasion of the 25th anniversary of Yamada Science Foundation, YSF. You will momentarily hear from Professor Yamada, the Director General of YSF, on the basic idea underlying the Yamada Symposium. My understanding is that YS is a platform to discuss science frontiers and perspectives of currently developing subjects together with young researchers.

It is often observed in biological systems that numerous components behaving apparently randomly at one level are organized into an ordered event at a higher level of the immediate next. The interplay between randomness-stochasticity and organization is a crucial element of life and a hallmark of biocomplexity. In this symposium, we will discuss the mechanisms, meanings and effects of stochastic events in biological systems with a very broad view in all senses to promote novel directions that may not have been stressed yet. Such discussions will encourage the

biologists of the next generation enterprising enough to pursue novel and seminal directions as well as the mathematicians, information scientists, physicists and chemists who wish to explore novel directions in biology.

Because the scope is very broad and the subject is really interdisciplinary, speakers will have enough time to explain the background of his/her work to the audience from various scientific fields. Also, much time is allocated for breaks in order to encourage discussions among the participants. For these, we have been trying to keep the number of participants rather small. We do hope and believe that you all enjoy good science, new and old friendship, as well as beautiful view of Mt. Fuji over the Sagami Bay for the coming four days.

I thank you all, especially those from overseas, for your participation despite of rather short notice. My thanks also go to the members of Advisory Committee for their indispensable suggestions and those of Organizing Committee for their kind cooperation. Finally, I would like to thank Yamada Science Foundation and Professor Yamada, the Director General of YSF, for their generous support and encouragement. Without all those, this symposium would not be crystallized.

Motonori Hoshi
Chairman of the Organizing Committee YS-3

## Welcome Address for The 3rd Yamada Symposium


山田理事長

Ladies and Gentlemen,

On behalf of Yamada Science Foundation, I would like to extend our hearty welcome to all of you who are participating in the third Yamada Symposium on From Chaos to Cosmos :Integration in Biological Systems, particularly to those who have come a long way to Japan from various places all over the world.

Yamada Science Foundation was founded in 1977 at Osaka, Japan. It develops its activities by giving supports to the outstanding research projects in the basic natural sciences, especially in the interdisciplinary domains that bridges between the well established research fields such as physics, chemistry, and biology. The Foundation also provides travel funds for the scientists to visit or to go out of Japan in order to carry out international collaborative projects. It also holds conferences and workshops etc..

As a private organization, we have the policy that the axis of our activities should be oriented in the orthogonal direction to the large scale activities carried out by the government. Recently, the governments of most of the advanced countries, including Japan, seem to recognize the importance of basic natural sciences, and tend to invest a large amount of money.

The underlying idea would be that it is useful for the future economical development of the country through advanced technological applications. This is in some sense legitimate because the source of the investment is the public money. Therefore the interests of the investment should be returned to the taxpayers in the form of the promotion of standard of living of the nation.

However, from the view point of pure promotion of basic sciences, such the pragmatic stance is not totally acceptable, because science is a part of the culture of human being which is valuable by itself. In other words, science has its own internal motivation of development irrespective of whether it is useful for something else or not. It is this internal motivation that our Foundation is willing to give support, although the amount of money is rather modest.

Upon these considerations, we started in 2003 a new activity: that is the organization of a series of international symposia called Yamada Symposium. Yamada Symposium provides a forum of discussions among the scientists belonging to different generations as well as different nationalities. We put emphasis on different generations. Why? Because the achievements of culture should be measured in the time scale of centuries rather than decades.

We envisage the following scheme of Yamada Symposium: The scientists who are the most active members of the present generation and the scientists who are expected to be most active in the next generation in a selected research field are invited to get together. The former presents the present status and the perspective view of the research field, while the latter receives the messages and, through hot discussions, would pick up some hints of the way for him to proceed. By this way, Yamada Symposia would function as the driving mechanism to drive the science in the proper direction guided by the internal motivation.

This is the third symposium of the series. The subject is Integration of Biological Systems, which will be discussed based on wide range of natural sciences and novel concepts. I would like to take up this opportunity to express our sincere thanks to Professor Motonori Hoshi and the members of the organizing committee who have made every effort to bring such a beautiful performance of the meeting.

I hope all of you would enjoy the symposium and also relax sometime in this attractive site of SHONAN VILLAGE.

Thank you.

Yasusada Yamada
Director General of
Yamada Science Foundation

本シンポジウムを計画するにあたっては、いささか無謀とも思えるテーマをとりテ－マを取り上げた。すなわち、生物現象にはしばしば見られる「ある階層では確率的あるいはランダムに起こっているように見える事象が、一段上の階層では極めて整然とした秩序だった事象に統合される」ということの意味や機構について検討することとした。生物学のみならず数学、物理学、化学および情報学などの分野で活躍する 20 代から 70 代の研究者 48 名がアメリカ、カナダ、イギリス、イタリア、ドイツ、ハンガリー、ニュージーランドおよび日本の 8 カ国（国籍としては11カ国）から集い、充分に持間をかけて熱い討論を交わした。参加者の学問的背景が多岐にわたることを考え、講演には充分時間をかけること（開会講演 2 題各 60 分、招待講演 27 題各 45 分)、個人的にも充分討論が出来るように休憩を多くとること（ほぼ 2 演題毎に 30 分)、毎夕食後はポスター（7 題）を取り囲み、ビールなどを飲みながらさらに討論を続けることを心がけた。

シンポジウムは山田理事長による YS3 President の歓迎挨拶に始まり、“Mechanism Involved in Utilizing Fluctuations by Biosystems”（T. Yanagida, Osaka University）および “Towards Integrative Natural History”（Y. Oono, University of Illinois at Urbana-Champaign）の開会講演、Randomness and Stochasticity, From Molecules to Cells, Organisms-1 Development , Organisms-2 Behavior–, –Biodiversity and Evolution という 5 つのセッションでの招待講演と続き、最後に “Concluding Remarks: Towards the Next Steps”（H. Koizumi, Hitachi Ltd.）によって将来を展望しながら締めくった。

発想、材料、手法の異なる講演とポスターを中心にして、議論はいつ果てるともなく連日続き、多くの参加者から小さいが中身の濃い会で実に楽しかった、ぜひ第 2 回、第 3 回と継続せよ、議論した内容を書籍として刊行せよなどという言葉をいただき、組織委員としては嬉しいことであった。また、山田科学振興財団の由来とこれまでの活動を知った海外の参加者からは、財団の高い志に感銘した、このような会（ですら）支援する心意気は只々素晴らしいの一語に尽きる、さらに発展して欲しい等々の言葉をいただき、誇らしい思いをした。

最終日の午後は、鎌倉に遠足して古都の秋を楽しみ、さらにその晩はバンケットを行って歓を尽くした。