

**JSPS Core-to-Core Program**  
**FY2007 Implementation Plan (Project No. : 17004 )**

**Research Theme** Center for advanced research on the interstellar medium in sub-mm waves and gamma rays

**Duration of Project** 2007 / 4 / 1 - 2010 / 3 / 31 ( 36 months)

**Core Institution in Japan (Co-Chair)** Graduate School of Science, Nagoya University  
( Yasuo Fukui )

**Implementing Organizations**

**Japan**

|       |                           |   |   |
|-------|---------------------------|---|---|
| Japan | Core Institution          | Nagoya University   |   |
|       | Co-Chair (name and title) | Yasuo Fukui, Professor  |   |
|       | Cooperating Institutions  | NAOJ, University of Tokyo, Kyoto University, Osaka Prefecture University, Hokkaido University | Number of Cooperating Institutions<br>5 |

**Partner Countries**

|         |                           |                            |   |
|---------|---------------------------|----------------------------|---|
| Germany | Core Institution          | University of Cologne      |   |
|         | Co-Chair (name and title) | Juergen Stutzki, Professor |   |
|         | Cooperating Institutions  | University of Bonn         | Number of Cooperating Institutions<br>1 |

|        |                           |                                   |   |
|--------|---------------------------|-----------------------------------|---|
| U.S.A. | Core Institution          | Stanford University               |   |
|        | Co-Chair (name and title) | Tsuneyoshi Kamae, Professor       |   |
|        | Cooperating Institutions  | NASA, Goddard Space Flight Center | Number of Cooperating Institutions<br>1 |

|        |                           |  |                                    |
|--------|---------------------------|--|------------------------------------|
| France | Core Institution          | CESR (Centre d'Etude Spatiale des Rayonnements)      |                                    |
|        | Co-Chair (name and title) | Jean-Philippe Bernard, Researcher                    |                                    |
|        | Cooperating Institutions  | IAS, CEA/Saclay, LERMA/Paris, Strasbourg Observatory | Number of Cooperating Institutions |
|        |                           |  | 4                                  |

|           |                           |  |                                    |
|-----------|---------------------------|--|------------------------------------|
| Australia | Core Institution          | University of New South Wales              |                                    |
|           | Co-Chair (name and title) | Michael Burton, Professor                  |                                    |
|           | Cooperating Institutions  | University of Sydney, Macquarie University | Number of Cooperating Institutions |
|           |                           |  | 2                                  |

|      |                           |                              |                                    |
|------|---------------------------|------------------------------|------------------------------------|
| U.K. | Core Institution          | Cardiff University           |                                    |
|      | Co-Chair (name and title) | Anthony Whitworth, Professor |                                    |
|      | Cooperating Institutions  |                              | Number of Cooperating Institutions |
|      |                           |                              | 0                                  |

## Objectives of Research Exchange (including the five years after the project finishes)

In this program, we intend to carry out collaborative research on interstellar medium effectively and to educate young researchers by operating the sub-millimeter telescope NANTEN2 and the balloon borne telescopes, SUMIT, InFOCuS and FITE through multi-national cooperation based on short/long term stays of the members in the other partner countries. We will organize international workshops, many of small workshops, and an international winter school on interstellar medium for young researchers, aiming at constructing a strong international network of young-to-senior researchers also by utilizing the archive of astrophysical observational data which shall be obtained through this program at sub-mm and gamma-ray wavelengths.

## Results to the present

The collaboration on NANTEN2 sub-mm telescope is moving ahead smoothly between Japan and Germany, resulting in successful astronomical observations at 460/810GHz bands. Workshops, seminars, and collaborative works among the partner have been carried out to educate young researchers. The other domestic meetings helped preparation for the strategic research through wide-scoped discussions covering theoretical studies.

These continuing efforts resulted in a construction of a further worldwide collaboration network including optical, infrared, theoretical researchers studying interstellar medium. This also leads to an organization of NANTEN2 consortium, including new partners from Australia and Switzerland.

## Summary of FY 2007 Exchange Plan

### **Joint Research**

To promote the operation of the sub-mm telescope NANTEN2; the goal is to be attained by the collaboration between Nagoya and Cologne.

To promote the comparison between CO and gamma ray data; we will first make a comparative study on the datasets of EGRET and NANTEN and then will generalize it to the GLAST case.

To prepare for the balloon experiments at a hard X ray wavelength.

To promote the statistical study of infrared dust in molecular clouds; the goal is to reveal the role of PAH in molecular clouds in (sub)mm lines, infrared dust emission, and optical/infrared absorption.

To promote theoretical studies on interstellar medium based on recent observational results.

### **Seminar**

We plan to have NANTEN2 workshops, GLAST-NANTEN2 workshops, workshop on interstellar medium and several small workshops.

Young astronomers' school on interstellar medium will be also held.

### **Researcher Exchanges**

We plan to carry out frequent exchange of researchers among the partner countries.