

**JSPS Core-to-Core Program**  
**FY2009 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	Graduate School of Science, 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 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 1

U.S.A.	Core Institution	Stanford University	
	Co-Chair (name and title)	Tsuneyoshi Kamae, Professor	
	Cooperating Institutions		Number of Cooperating Institutions 0

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, the infrared satellite, AKARI, and the balloon borne telescope, 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 international winter schools 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 as well as 230GHz band. 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 partners from Australia and Switzerland.

## Summary of FY 2009 Exchange Plan

### **Joint Research**

The joint research plans are as follows;

1. NANTEN2 operations at Chile

SMART, a submillimeter multi-beam receiver (8 beams both at 460 and 810GHz simultaneously), has been installed in the NANTEN2 telescope in collaboration with University of Cologne and Bonn in Germany.

2. Comparative study of Gamma-ray and molecular cloud data: Fermi was launched successfully and the data of the all-sky is being taken.

3. Statistical study of infrared dust emission in molecular clouds.

4. Theoretical study of interstellar medium based on the recent observational results.

### **Seminar**

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

### **Researcher Exchanges**

We plan to carry out frequent exchange of researchers among the partner countries. Scientific outputs by this program will be presented at various international conferences.

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