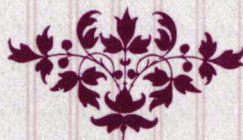




A Project Sponsored by  
China Research Institute for  
Science Popularization



**REPORT ON THE PROGRESS  
OF THE STUDY  
ON SCIENCE POPULARIZATION  
IN CHINA  
(2002–2007)**

Ren Fujun    Chen Ling





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**POPULAR SCIENCE PRESS  
BEIJING**

**图书在版编目 (CIP) 数据**

中国科普研究进展报告:2002~2007:英文/任福君等编著. —北京:科学普及出版社,2009.10

ISBN 978-7-110-07170-0

I. 中… II. 任… III. 科学普及-研究-概况-中国-2002~2007-英文 IV. N4

中国版本图书馆 CIP 数据核字(2009)第 183869 号

**本社图书贴有防伪标志,未贴为盗版**

策划编辑 徐扬科  
责任编辑 吕 鸣  
责任校对 孟华英  
责任印制 李春利  
封面设计 耕者设计工作室

科学普及出版社出版

北京市海淀区中关村南大街 16 号 邮政编码:100081

电话:010-62103210 传真:010-62183872

<http://www.kjpbooks.com.cn>

科学普及出版社发行部发行

北京正道印刷厂印刷

\*

开本:787 毫米×1092 毫米 1/16 印张:9 字数:150 千字

2009 年 10 月第 1 版 2009 年 10 月第 1 次印刷

定价:28.00 元

ISBN 978-7-110-07170-0/N·123

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(凡购买本社的图书,如有缺页、倒页、  
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# **China Research Institute for Science Popularization**

China Research Institute for Science Popularization (CRISP) is a non-profit organization engaging in studies on science and technology communication. Ranking as an exceptional research institute of the kind at the state level, CRISP has been for long operating in subordination to the China Association for Science and Technology (CAST). The Institute was granted to take shape by the State Council in 1980 at the proposal of the renowned Chinese scientist and science writer Gao Shiqi and now it embraces China Science Writer's Association (CSWA) as its affiliate.

CRISP commits itself mainly to fundamental academic studies in the interest of public good. Its principal commitments encompass both theoretical and applicable researches in regard of science popularization as well as comparable studies of equivalent concerns of other countries. Nowadays CRISP undertakes more than 40 research programs each year and advances in expanding collaboration with diverse research organizations beyond the border.

In recent years, CRISP has conducted a series of facts-finding researches in relation to "contents, channels, target audiences and mechanism of science and technology communication", "survey, monitor and analysis of public scientific literacy", "exploration and integration of science popularization resources", "science writing and science writers both within and outside China", "informal science and technology education", "science and technology coverage in mass media", and "evaluation theories and methodology practicable to

science popularization". The outcomes are highly rewarding and have served the relevant departments of the government beneficially in making policies regarding science popularization.

CRISP sits on a structure supported by several professional divisions. They are Divisions for: Science Popularization Theoretical Studies, Information Research, Scientific Literacy Research and Administrative Office. It runs a bi-monthly journal "Studies on Science Popularization" and produces a yearbook of "Science Popularization Report of China".

For more information about CRISP, please visit our website at: [www.crsp.org.cn](http://www.crsp.org.cn).

# Preface

In 2008, China Research Institute for Science Popularization set up a program of Report on the Progress of the Study on Science Popularization in China 2002 – 2007 ( hereinafter referred to as the Report) with an aim to make a systematic summary of the studies on science popularization in China. While carrying out the program, the team members focused on three issues in terms of defining the covering period of the Report, collecting of data or information and confirming the consistence of the style.

Defining the beginning and ending years of the Report means fixing the time range of the collection of data or information. The Law of the People's Republic of China on Popularization of Science and Technology ( hereinafter referred to as the Law ) was enacted in 2002, which stands as a milestone in the history of the development of science popularization in China. In line with the principles laid by the Law and in order to mobilize the resources of the society and take advantage of social forces at large to promote the development of science popularization, the China Association for Science and Technology ( CAST) developed a number of grants, among which the research on science popularization is classified as one category. More than 50 grants of the kind have been completed, providing important references for this Report. Thus, the study materials of the Report are those published literatures concerning theoretical and practical study on science popularization in China from 2002 to 2007.

What information to collect concerns the boundaries of the research. Following the principle of limited boundaries and highlighting the significant issues, the team members set their hand to literature

retrieval between March and May of 2008 in National Knowledge Infrastructure (CNKI) database by searching for the titles and key words of public understandings of science, science and technology education, science popularization, science communication, scientific literacy and scientific literature. The systematic objective summary of these periodical articles, theses, conference papers as well as books among the retrieved materials gave rise to this Report.

The consistence of the style was confirmed on the principle of operableness, objectivity and referentiality. This goes well with the aim of the Report, which was designed to write objectively about the studies on science popularization in China in recent years and provide the researchers both domestic and abroad, practitioners and policy makers with related referential material.

There are nine parts of the Report. An Overview of the Study on the Theory of Science Popularization and An Overview of the Study of Policies and Regulations of Science Popularization were written by Zhu Hongqi; An Overview of the Study on Scientific Literacy and An Overview of the Study on Science and Technology Education were written by Li Xiuju; An Overview of the Study on Community Science Popularization and An Overview of the Study on Science Popularization in China's Rural Areas were written by Wang Lihui; An Overview of the Study on Mass Media and Science Popularization was written by YanYan; An Overview of the Study on Natural Science Museums was written by Yin Rui and Analysis of University Postgraduate Students' Researches on Science Communication and Popularization was written by Zhang Feng. Professor Ren Fujun, Doctor Chen Ling and Doctor Zhang Huiliang were in charge of the editing of the Report.

Program supervisor Professor Ren Fujun and executive group leader Doctor Chen Ling both greatly contributed to the research and completion of the Report in terms of designing and planning. They also engaged themselves in the practical research. The consultants of the



program had many a discussion with the team members whenever needed. The English version has been translated by Zhang Huiliang, Wang Dapeng, Zhang Feng and Wang Lihui; and proofread by Shi Shunke and Yu Qiyu.

Any errors that remain are entirely our own, so we gratefully admire the corrections of the readers.

Project team of Report on the Progress  
of Study on Science Popularization  
in China 2002 – 2007

December 25, 2008

# Contents

An overview of the study on the theory of science popularization in China 2002 – 2007 .....	(1)
An overview of the study on policies and regulations of science popularization in China 2002 – 2007 .....	(14)
An overview of the study on scientific literacy in China 2002 – 2007 .....	(30)
An overview of the study on science and technology education in China 2002 – 2007 .....	(43)
An overview of the study on community science popularization in China 2002 – 2007 .....	(60)
An overview of the study on science popularization in China's rural areas 2002 – 2007 .....	(72)
An overview of the study on mass media and science popularization in China 2002 – 2007 .....	(85)
An overview of the study on natural science museums in China 2002 – 2007 .....	(94)
Analysis of university postgraduate students' researches on science communication and popularization in China 2002 – 2007 .....	(114)

# **An overview of the study on the theory of science popularization in China 2002 – 2007**

The study on science popularization theory was enlivened in China in the period of 2002 – 2007. During the time, Chinese researchers had carried out in-depth review over traditional science popularization theory, put forward a series of new concepts and theories, and made comparatively in-depth study on science communication theory. Compared with the previous studies, there was a major breakthrough in terms of the depth and scope of research, albeit there were still a number of problems remained.

Regarding the advancement of the study on science popularization in China, Liu Bing suggested that it had gone through two phases since 1990's. The first phase was initiated by the opening of the 1st symposium of science communication organized by Tsinghua University in Oct. 1995. During the time, the research was basically centering around exploration and reflection. Many research projects were focused on macroscopic level. The science communication research was still in its initiate stage. The second phase was started by the raising of the new concept of science communication in 2000.

Studies on science communication in the second phase were unfolded based on the reflection in the first phase. Some scholars including Wu Guosheng, Liu Huajie and others put forward the new concept of science communication. The research in this stage was lively. The study on science communication had been deepened progressively, it was no longer limited by superficial introduction or any general macro exposi-

tion on science popularization.

It is exactly the second phase of research which will be the focus of discussion for this overview. As during that time, people believed that the issue of what to communicate was clear-cut and didn't need more discussion, the focus was thus boiled down on the issue of How to communicate, and what was ignorant was the particularity of science. However, when people looked back to the research in this stage later on, they found that the issue of what to communicate was remained unsettled, and consequently there were some major changes in respect to the issue of "how to communicate" as well as the way of settlement and even the concept itself. It was exactly based on such reflection that some researchers had made brand new examination on science communication in China.

In the second phase, the study on science communication was unfolded along the development clue of "what to communicate", i. e. the pondering on "science", and the reflection on "how to communicate". Up to date, the reflection is still continued to be deepened and debated.

## **I . The study on science popularization under multidimension perspective**

Since the study of Science and Technology (ST) popularization is a field of interdisciplinary research, there are multiple dimensions in terms of research methods and the angles of view. It is the distinguishing feature of the study on science popularization theory in China from 2002 to 2007.

Cheng Donghong made a point in her paper that science popularization plays an important role in supporting sustainable development. According to Zhao Lixin, Science popularization is essential in improving innovative capability of the country. Wu Xiulin indicated in her paper that science popularization is a strategic project in opposing

feudal superstitions. Science is a part of advanced culture. Science popularization and the struggle against feudal superstitions are essential requirements for modernization. In recent few years, feudal superstition, pseudo-science and anti-science gained some ground, which seriously interfered the development of material civilization and spiritual civilization. Therefore, it will be a long-term strategic project to strengthen ST popularization aiming at the improvement of the citizen's scientific literacy.

Chinese scholars have constantly deepened their understanding of what is science popularization. He Yubing approached science communication from the angle of system theory: the modern science communication system consists of four elements, namely, the subject of communication, the media, the object of communication and the aim. He also analyzed the hierarchies and types of science communication system.

Li Yongwei indicated in his paper that science popularization, science and scientific literacy are important knowledge system, value system and practice content in the era of science culture, and will exert profound influence to the quality of a nation and each individual; therefore, it is important to correctly interpret and understand their connotation and interrelationship.

Zeng Guoping made an exploration on science communication and science popularization from the perspective of national innovation capacity system. Proceeding from the angle of national innovation capacity, he made an exploration on the essence of knowledge communication, the mechanism of knowledge communication, as well as the relationship between knowledge communication and national scientific literacy construction, etc.

Li Daguang summed up the studies since the concept of public understanding of science first introduced into China, and discussed on the surveys made on the public scientific literacy, as well as made an ex-

ploration on the different points of attention toward scientific literacy under different social morphologies and in different countries where the concept of scientific literacy have been formed. He reexamined in his paper the indicators of the surveys, and suggested to build up the index system and the method of survey in conformity with China's own social morphology. In the meantime, he proposed the research method with the combination of qualitative approach and quantitative approach as well as the train of thoughts required by the surveys. He suggested to spend an effort of one or two years to establish the viewpoint and method which should be able to make a horizontal comparison internationally and at the same time to make a vertical comparison on domestic development tendency.

Chinese scholars analyzed various influencing factors of science popularization. Taking the influence of cultural context to science popularization as example, Ji Guoqing pointed out that the improvement of national scientific literacy should be relied on science popularization. It is an important path to take the advanced experiences of science popularization of the developed countries as reference to enhance the level of science popularization in China, so as to narrow down the gap of science popularization between China and that in the developed countries. The research had proved that the gap is not determined by any single factor, but embodied in various aspects, including concept, definition, objects, subjects, functions, roles and status. The formation of the gap is derived from more factors, such as history, culture, ST level, traditional customs, etc.

Wu Xuejuan pointed out in her paper that cultural context has both positive and negative influences on public understanding of science (PUS). She suggested that the principle of systematicness and integration should be followed in building up the cultural context which should be able to enhance public understanding of science. Firstly, it is necessary to make clear the overall goal and to start from the optimization of specifics; Secondly, it is necessary to coordinate the relation-

ship between various elements as well as between the system and the environment, and to pay attention to the overall benefits.

With regard to science communication media, Huang Kexin identified that efficient science communication is the most important way to improve citizen's scientific literacy, and the development speed of modern media is beyond that of any other media before. As for the influence of media upon science communication, Hou Qiang and Liu Bing believed that the media is not just the means of communicating, the great development of media technology has made huge influences upon science communication and the progress of science communication.

Some other scholars debated on science communication ethics. Wang Hongxian made an exploration on science communication from the perspective of ethics and put forward the issue of moral responsibility of science communication. He also analyzed the relationship of moral responsibility between scientists, media, audience and government.

Ma Guiying, doing research on marginal group, analyzed science popularization for women, the disabled, farmers and the poor. She pointed out that scientific literacy and science acquisition of marginal groups showed that the issue of equity of science popularization had hardly accomplished.

Some researchers studied on the consensus conference, especially those international ones. Zhu Xiaomin focused on the shifting role of scientists'. Some researchers studied on science popularization history in China. For example, Han Jianmin examined science popularization model in late Qing dynasty. Tian Xiaofei et al explored the features of citizen's scientific literacy after the founding of People's Republic of China. Shen Zhenyu also explored the science popularization history in China.

## **II. Three phase theory of science communication**

In 2000, Liu Huajie and Wu Guosheng introduced the notion of science communication and the three phase theory of the development of science communication: traditional science popularization, PUS and science communication. After reflection and criticism on the traditional science popularization notion, they put forward a new science popularization notion. Wu thought that science communication and traditional science popularization have “the overlapping working fields”, but they differ in terms of connotations. He suggested that people should understand and deal with science in a “pluralistic, equal, open and interactive” way; He also emphasized on the interaction between science community and the public.

Liu Huajie gave further interpretation to the three phase theory. In the first phase, it's assumed that there is a two-graded relation between communicators and audience, the upper grade and the lower grade. The upper grade includes scientific community and a small number of practitioners in ST media. They master much more knowledge of ST. The lower grade is the public. In this phase, there is no feedback from the lower grade to the upper grade, only messages instilled from the upper grade to the lower grade.

In the second phase of PUS, the pattern of science popularization is changed, the public ask to have their voices to be listened to, and they are no longer passive acceptors. The public's role had shifted into that nearly as important as that of scientists; the public have the right to claim the same scientific and technological information, and an all-round report from scientists and media.

The notion of science popularization should upgrade. The second phase of PUS was still dissatisfying for its narrow target, concerning more of scientific community than the public. Liu defined the third phase as sci-



ence communication.

Liu's three phase theory had stirred up much more debates, and later on he defended with his "Standpoint theory" and believed that traditional Science Popularization is from government's standpoint, PUS is from scientific community's standpoint and science communication is from citizen's standpoint. They have some overlapping working fields, but differ in some certain ways. These differences reflected various value orientations and doctrines of science communication.

Three phase theory which stirred up heated debates and called for science communication instead of traditional science popularization has gone beyond the scope of traditional science popularization. The notion of science communication enriched people's understandings of science popularization, whether it has been widely accepted or not. Three phases of traditional science popularization, PUS and science communication are not strictly taken place one by one in accordance with precise historical development. Science popularization, PUS and science communication can be exist in one stage with overlapping working fields. Three phase theory has criticized traditional science popularization, widened the horizon of the study on science communication in China and sorted out the developing thoughts of science communication. It will be useful in integrating scientific resources in some way. Meanwhile, it is important to enrich the practicing of science communication in China.

### **III. The first and second level of science communication**

Chinese researchers of science popularization had made deep reflection on the issue of what to be conveyed.

From the viewpoint of traditional science popularization, science had been a definite object of conveying, so, the issue of what to be conveyed should be very clear. Science communication should spread the