南开大学自然科学论文摘要集

（1986—1987）

Collection of Abstracts of Natural Science Papers of Nankai University

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Edited by Department of Library & Information Science
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编 辑 说 明

1. 本文摘集依据我国国家标准《信息交换用汉字编码字符集——基本集》(GB2312-80)编制索引，按一般符号、数字、拉丁字、希腊字母和汉字的顺序排列，其中汉字按汉语拼音顺序排列。

2. 本文摘集的学科目录用中、英两种文字编辑。其中英文条目与中文条目对应，系和学科以英文字首顺序排列。同一学科类目下的篇名按汉字音序排列。

3. 本文摘集的作者索引只反映南开大学的作者，按作者姓名的音序排列。

4. 文摘以最先发表的文种排在上方，相应的译文列于下部。国外的期刊以中文注明出版的国别。

5. 本文摘集采用的编辑体例与上一集相同。

编　者

1989 年 9 月

General Introduction

1. The indexes of this collection were compiled with reference to the arrangement of the Chinese National Standard "Character Set of Chinese Code for Information Interchange—— Basic Set". Their sequence is general symbols, digits, Latin alphabets, Greek alphabets and Chinese characters. The Chinese characters were arranged in Chinese phonetic alphabetical order.

2. The subject catalogue in this collection was compiled both in Chinese and in English. The sequences of departments and science branches were arranged in English alphabets. The English entries correspond to the Chinese ones. The lists of articles in the same subject were arranged in Chinese phonetic alphabetical order.

3. The author index of the collection includes only those who are working at Nankai University in the issued period. The index was arranged alphabetically by the authors' names.

4. Each abstract at the top of the page was issued first, the corresponding translations are at the bottom. The name of the publishing country of a foreign journal is noted in Chinese.

5. The stylistic regulations for compilation of the collection are same as the previous collection.

September, 1989

Editor

序

人类社会之所以能不断地进步，主要来自于人类会产生知识。大学不仅是传播知识的实体，更是产生知识的一个重要源泉。南开大学建校七十年来，为中华民族培育无数英才，更为社会创造良多知识。正因为如此，她才驰誉国内外。

南开大学师生每年在国内外著名的学术刊物上发表大量的优秀论文。他们用汗水和脑汁为丰富人类知识宝库作出了自己的贡献。将这些优秀的成果记录下来并汇集成册，不仅有益于学术交流，而且也便于检阅南开大学在科学上前进的步伐。两年前，出版了1981—1985年南开大学师生发表在国内外著名学术刊物上的论文的摘要，为第一册；现在这一本是第二册，记录了1986—1987年发表的优秀的自然科学论文的摘要。今后，每两年出一期。长此坚持下去，特别是把人文社会科学再扩充进来，它实际上将成为南开大学的科学史册，受到国内外学术界的欢迎和重视。

祝《南开大学自然科学论文摘要集》旗开得胜，永受欢迎。

南开大学校长　教授

母國光

一九八九年五月九日

Preface

Human society has continued to progress because of mankind' s ability to develop new ideas. The role of the universities is not only to educate people, but also to expand mankind' s understanding through research.

Since the founding of Nankai University 70 years ago, a large number of gifted people have received instruction. These people have gone on to make unnumerable contribution to society. Because of these people and their work, Nankai has won fame, both here and abroad.

The faculty and students of Nankai University have contributed excellent papers to outstanding academic publications both inside and outside the country each year. Their contributions to the repository of human knowledge are made with their intellectual abilities and hard work.

To record these fine academic achievements and make a collection of them, is of value not only for academic exchange, but also for the convience of reviewing the advancing steps of Nankai University in the science world. Two years ago, the abstracts of natural science papers of faculty and students at Nankai University issued in academic publications both inside and outside the country from 1981 to 1985 were compliled and published. That was the first volume, and now, this collection which records the abstracts of good theses on natural science issued in 1986-1987 is the second volume.

In the future, one volume will be published every two years. Furthermore, these abstracts will be enlarged to include the social science. These collections will actually be the history books of scientific advancement at Nankai University. It will be welcomed by academic circles world wide as an important reference source.

May "Collection of Abstracts of Natural Science Papers of Nankai University" win victory the moment its banner is unfurled. May it be forever welcomed.

President of Nankai University, Professor

母國光

Guoguang mu

May 9th, 1989

内 容 简 介

本文集汇编 1986 年至 1987 年期间南开大学师生发表在国内外重要学术刊物上的自然科学论文摘要 425 篇。包括生物学系 39 篇，化学系 126 篇，计算机与系统科学系 12 篇，电子科学系 16 篇，环境科学系 22 篇，数学系 11 篇，物理系 88 篇，测试计算中心 9 篇，分子生物学研究所 15 篇，高分子化学研究所 19 篇，南开数学研究所 2 篇，现代光学研究所 19 篇和元素有机化学研究所 47 篇。附学科目录、篇名索引和作者索引。均为英汉对照。

这是继两年前出版的上一卷(1981—1985)接续编集的，献给南开大学建校七十周年。下一卷(1988—1989)将随后出版。

Brief Introduction

This collection was compiled with the abstracts of 425 papers written by the faculty and students of Nankai University. They were from 13 departments, institutes and centers——Department of Biology, Chemistry, Computer & System Science, Electronic Science, Environmental Science, Mathematics, and Physics; Center of Measurement & Calculation; Institute of Molecular Biology, Macromolecular Chemistry, Modern Optics, Elementoorganic Chemistry, and Nankai Institute of Methematics. This collection included the Contents, Title Index, and Author Index. All the contents were translated into English. It was dedicated to the 70th anniversary of the founding of Nankai University. The next volume (1988—1989) will soon be presented.

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植物学

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物理化学

计算机与系统科学系

线性系统的分析与设计

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电子科学系

环境科学系