

National Center for Theoretical Sciences, Mathematics

自然處2023新進人員聯合研討會 9.01-02

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Brief History

1997/08

Phase I, founded at NTHU



2015/01

Phase IV

One Center for Math, at National Taiwan University
One Center for Physics, at NTHU



2004/01-2014/12

Phase II, III

NTHU+NTU &NCKU

2020/08/10

New space!

2021/01-2025/12

Phase V
NTU





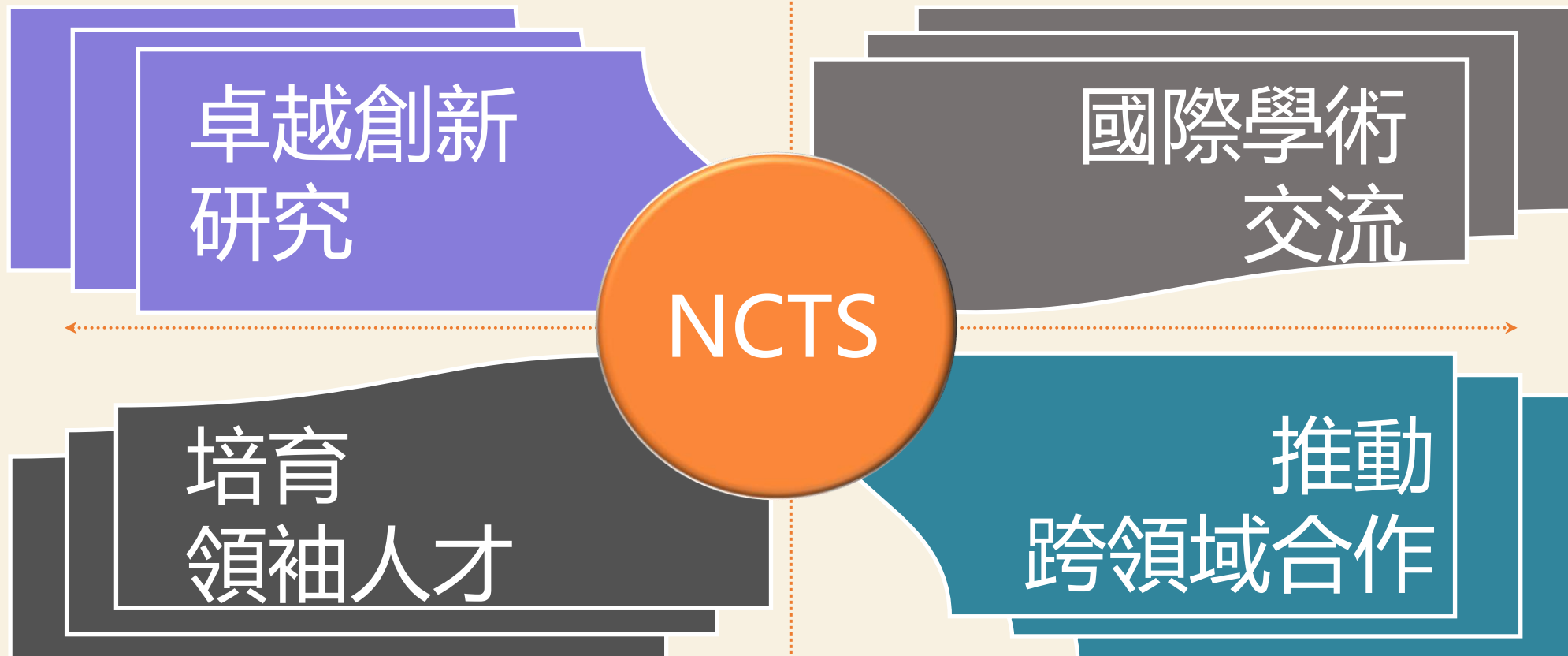
Goals and Missions

- + Aims to be an international center of excellence in theoretical sciences
- + Fostering world class outstanding researchers in Taiwan
- + Promoting international cooperation and collaborations
- + Fostering talented students into mathematics research
- + Attracting top young researchers to do cutting edge research in NCTS
- + Serving all theoretical scientists in Taiwan and promoting interdisciplinary research



目標

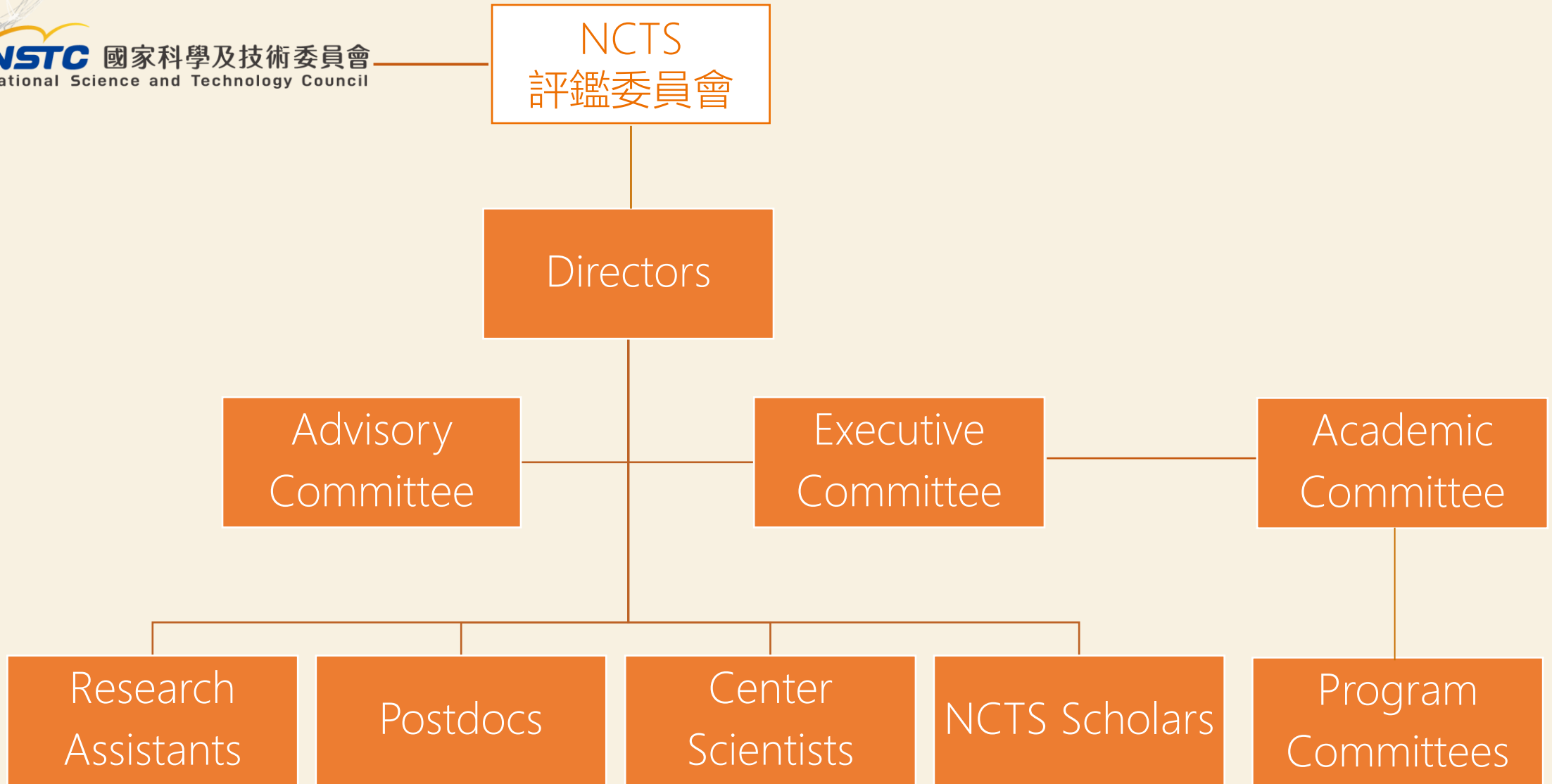
建立台灣理論科學學術品牌



Structure of NCTS Math



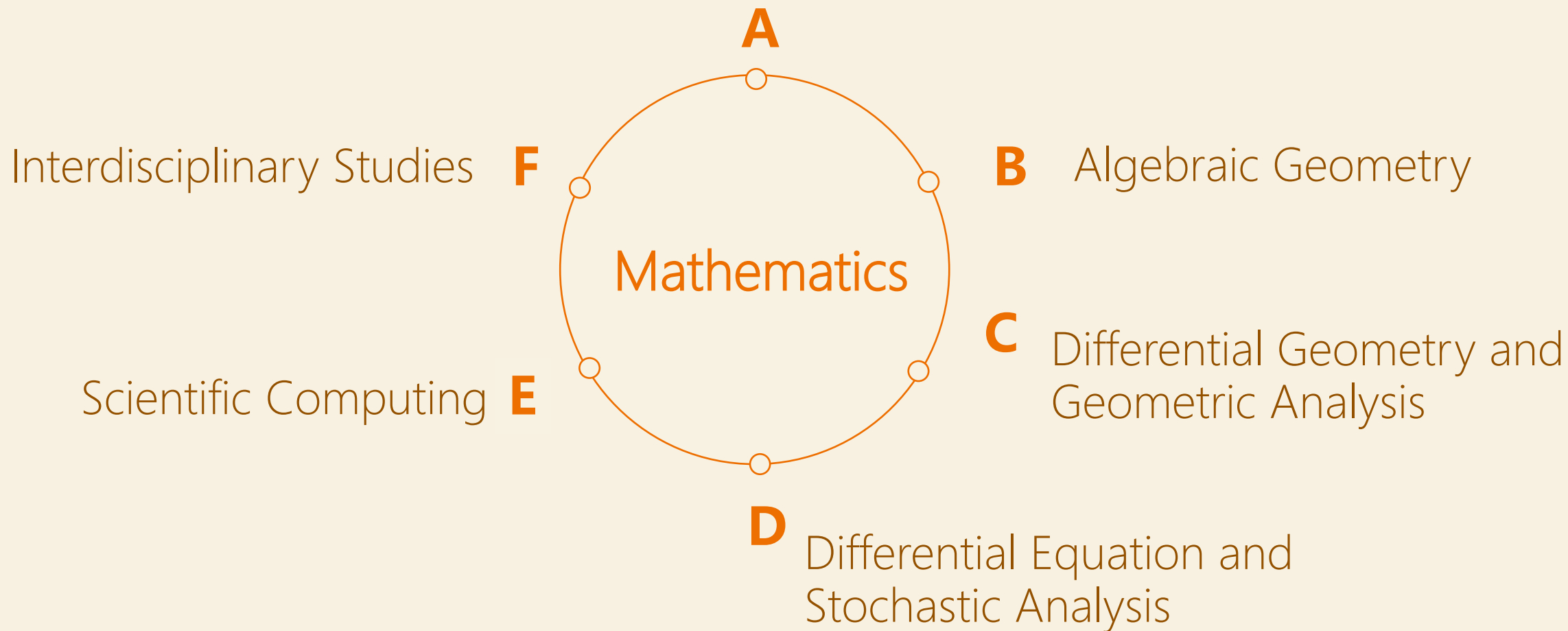
NSTC 國家科學及技術委員會
National Science and Technology Council

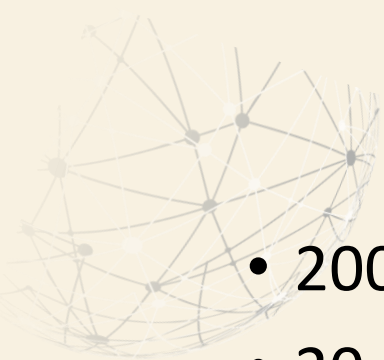




Topical Programs

Number Theory and Representation Theory





Activities and Related

- 200-300 seminars a year (128 from 2023.1.1-7.31)
- 20-30 Workshops and Conferences a year (30 from 2023.1.1-7.31)
- 20-30 Courses and Lecture series a year (25 from 2023.1.1-7.31)
- Before Pandemic, 200-400 Visitors with total 4000-5000 days of stay a year. (146 from 2023.1.1-7.31)
- Postdocs
20 in 2021 (12+8T), 15 in 2022 (11+4T, +2A), 12 from this Aug. (8+4T).
- RA (spring and fall term, 5-8)
- Research in Pair
- International Exchange Program



Space

- 4F of Cosmology Hall:
 - 2 discussion rooms (R401 / R408)
 - 8 offices for postdocs
- 5F of Cosmology Hall:
 - Lobby (R501), 4 lecture rooms (R509 / R515/ R505 A&B)
 - 2 discussion rooms (R506 / R512)
 - 6 offices for visitors
 - Director's office (R502), Administration office (R503)
 - Stationery (R504)

另有原新數館部分空間，及借用天數館R440演講廳
新竹清華大學原理論中心數學組部分空間



What can the NCTS help you?



- Provide excellent academic activities including seminars, workshops and international conferences.
- Host many leading mathematicians visitors.
- An excellent platform to meet and collaborate with people both in local and international communities.
- Train students and learn new material.

(Mini courses and lectures, USRP, URP, RA, summer/winter schools abroad, and other special events)

- Research support and awards

(Travel support, International Exchange Program, Research in Pair, NCTS YTSA, Center Scientist,...)



新進學者參與模式

找出研究興趣最接近之topical Program，與該Program之成員互動，積極參與各類活動。大多領域會每年固定舉辦1-2次Symposium。

藉助其中資深學者的經驗及國際網絡，建立自己的國際網路。

參與寒暑假學術活動或是由理論中心推薦補助赴國外參加暑期學校或短期訪問研究。

理論中心鼓勵年輕學者走出博士論文的格局，協助追尋新的研究題目，維持他們的研究動能，並跟上國際最新的研究主流。



International Exchange Program



- 提供台灣數學研究者與國外知名機構進行合作、學術交流
- 優先考慮級別: 助理教授、博士後研究員、博士班學生
- 交流期間: 1 ~ 3 個月
- 合作國外機構:

BMS (Berlin Mathematical School), Germany

Fields (The Fields Institute for Research in Mathematical Sciences), Canada

KIAS (Korea Institute for Advanced Study), Korea

PIMS (Pacific Institute for the Mathematical Sciences), Canada

RIMS (Research Institute for Mathematical Sciences), Japan



年輕理論學者

- 年齡在四十二歲以下
- 副教授、副研究員或相當職級以下
- 未曾獲得國科會傑出研究獎、吳大猷先生紀念獎、中研院年輕學者著作獎
- 鼓勵年輕學者從事重要領域之深刻研究



中心科學家

- 國內外各大學或研究機構之講座教授、教授、副教授或助理教授
- 促使學者致力於尖端理論科學之研究、鼓勵國內外優秀理論科學學者定期或長期赴國家理論科學中心研究
- 追求卓越研究成果，協助推動各Topical Program之運作並協助中心規劃學術活動



RESEARCH IN PAIRS



- 吸引國際頂尖學者來台從事 on-site research
- 由二位至四位成員所組成，不可全任職於同單位
- 於本中心從事研究工作二周至四周（正研擬延長）



國內學者移地研究

- 國內大學研究表現傑出之學者赴理論中心研究為期一個月至一年
- 移地研究補助與津貼



Thank You !





International Cooperation



Canada | Fields Institute
Exchange researchers

Canada | PIMS
Exchange researchers

Germany | BMS
Exchange students

Korea | KIAS
Exchange researchers

Korea | PMI
Joint workshop

USA | MSRI
Joint Summer Schools

Jul 29 (Mon)-Aug 9 (Fri), 2019
Jul 18 (Mon)-Jul 29 (Fri), 2022

Japan | RIMS
Exchange researchers





Cultivation of Youth



- Undergraduate Students
 - Undergraduate Summer Research Program (USRP)
 - Undergraduate Research Program (URP)
 - NCTS Summer/Winter Schools
 - NCTS Research Assistantship

- Graduate Students
 - Taiwan Mathematics School (TMS)
 - NCTS Summer/Winter Schools
 - EACDFM

Support for International Summer Schools and Visits



Undergraduate Summer Research Program ([USRP](#))

- Project-oriented studies for undergraduate students during summer
- Each group consist of 2-4 students under the supervision of one or two advisers and one TA.
- 9 teams and 28 students in 2021, 9 teams and 32 students in 2022
9 teams and 30 students in 2023


Undergraduate Research Program ([URP](#))

- As bridge/continuation programs for USRP or MOST Research Project for Undergraduates. It lasts for 9 months from Oct. 1 to June 30.
- It can be further advanced studies after USRP or provide an opportunity for project-oriented basic training before USRP.
- USRP+URP+ NSTC can provide a motivated student a solid 2 year training.
- 2020.10.1-2021.6.30, 11 teams, 19 students; 2021.10.1-2022.6.30, 9 teams, 17 students; 2022.10.1-2023.6.30, 8 teams, 15 students

A decorative graphic in the top left corner shows a network of interconnected nodes and lines, resembling a globe or a complex graph structure.

Research Assistants at NCTS

- Full time position, each term half an year, at most two terms.
- For those who are interested in pursuing mathematics research and with a bachelor or a master degree.
- Carry out independent studies under a guidance of a mentor and participate in at least one of the NCTS Topical Programs.
- Our hope is that research assistants will be able to enroll in a Ph.D. program in a world leading research university and their stay at the NCTS helps to prepare them for this task.
- 8 in 2021F & 2022S, 5 in 2022F, 8 in 2023S, 8 in 2023F.
- RAs from 2021 attend graduate schools such as Cal Tech, University of Washington, Kyoto University, University of Cologne, etc.

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- SLMath (MSRI), Berkeley, USA
 - MSRI-NCTS joint summer schools
 - Toric Varieties*, Jul 29 (Mon)-Aug 9 (Fri), 2019.
 - Recent Topics in Well Posedness*, July 18 (Mon)-29 (Fri), 2022.
 - Due to the strict Covid restrictions in Taiwan, it moves to Hawaii.
 - NCTS supports 8 people to this summer school.
 - In 2022, the NCTS recommended three other students with MSRI support to summer schools in Athens, Greece, New York and California, USA.
 - In 2023, the NCTS supported 5 students to SLMath Summer Graduate Schools and one to PCMI Undergraduate Summer School.
 - Survey and pass information on summer schools abroad.
 - Under discussion: research abroad and co-supervision.

- EACDFM= East Asian Core Doctoral Forum in Mathematics
 - Jointly with Japan, Korea, China
 - A forum mainly organized by Ph.D. students
 - Each country recommends up to 10 students
 - Japan (Tokyo, Kyoto, Tohoku)
 - China (TsingHua, Fudan)
 - Korea (Seoul National, Enhwa Women Univ., Changgungwan Univ.)
 - Taiwan (NTU, NTNU, NTHU, NCTU, NCU, NCKU,.. Organized by NCTS)
 - 2014 Kyoto
 - 2015 NCTS
 - 2016 Fudan
 - 2020 Tokyo
 - 2021 NCTS (postponed to 2023)