REPORT OF THE INTERNATIONAL CENTRE FOR RESEARCH AND POSTGRADUATE TRAINING IN MATHEMATICS UNDER THE AUSPICES OF UNESCO



from 2020 to 2025

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I. ESTABLISHMENT OF THE CENTRE

General information:

- Name: International Center for Research and Training in Mathematics (under the auspices of UNESCO).

- Decision on the establishment of the Center: Decision No. 307/QĐ-VHL dated March 5, 2018, by the President of the Vietnam Academy of Science and Technology.

- Director: Assoc. Prof. PHAN Thi Ha Duong

- Address: A6 Building, 18 Hoang Quoc Viet, Hanoi, Vietnam

- Phone: 024 37563474, Fax: 024 37564303, Email: icrtm@math.ac.vn

- Website: http://icrtm.vast.vn/

1. Approval process for sgreements between the Government and UNESCO

- October 26, 2015: At the 38th session of the UNESCO General Conference in 2015, a decision was adopted to establish two Mathematics and Physics Centres in Vietnam under the auspices of UNESCO (Category 2 Centres).

- August 24, 2017, in Hanoi: The Ministry of Science and Technology of Vietnam and the Director-General of UNESCO signed an agreement to establish the centre.

- April 11, 2020: The Prime Minister of Vietnam signed Decision No. 43/NQ-CP approving the Agreement between the Government of the Socialist Republic of Vietnam and the United Nations Educational, Scientific and Cultural Organization (UNESCO) on the establishment of the centre.

- May 12, 2021: The Prime Minister of Vietnam issued Decision No. 701/QD-TTg approving the Implementation Plan of the Agreement between the Government of the Socialist Republic of Vietnam and UNESCO on the establishment of the International Centre for Research and Training in Mathematics (ICRTM).

2. Objectives, and tasks of the Centre

i. The objectives of the Centre

- Undertake research and training in mathematics at the highest international standards;

- Provide an international centre for capacity building in the basic sciences, through schools and workshops;

- Support research in those countries in Southest Asia, Asia-Pacific and in the least developed countries in Africa, where mathematical research is not yet well-developed; and,

- Provide expertise to decision makers, educators and the general public to strengthen the research and development potential in the region and beyond.

ii. Tasks of the Centre

The functions of the Centre shall be to develop training and regional capacitybuilding activities with a focus on:

- Advanced training and development through scientific research, carried out by the Centre's permanent staff and by short/long term visitors, in cooperation with national and international institutions and with participation in international research projects; and,

- Scientific events and knowledge transfer through short-term activities, developed in cooperation with UNESCO's IBSP, ICTP and other scientific institutions, including schools, workshops, conferences and seminars compatible with UNESCO programmes.

- On May 12, 2021, the Government approved the Centre's activity plan, which specifies 7 tasks:

•Organization of the Centre's structure,

•Organization of training in mathematics at the international level,

•Organization of mathematical research activities at the international level,

•Organization of international cooperation activies,

•Organizing consultancy activities for policy makers, education experts and public propaganda on mathematics,

•Ensure conditions for activities of the Centre,

•Meeting and reporting mode.

II. ACTIVITIES REPORT

Since 2020, the Centre has successfully achieved its objectives: completing the organizational structure, equipping physical facilities, establishing regulations to ensure the implementation of activities; developing 12 outstanding research projects and 40 training projects (postdocs, PhDs, masters); publishing 106 articles in SCIE journals, enhancing international cooperation with 13 international conferences with over 600 scientists participating, 15 international schools with over 500 students; organizing 20 mathematics promotion events and spreading the spirit of UNESCO with over 2,000 participants, 300,000 online views, and coverage by 200 media artciles. Below is the report on the 7 tasks according to Decision No. 701/QD-TTg.

1. Organization of the Centre's structure

i. Establishment and issuance of organizational operation regulations

- On March 5, 2018, the President of the Vietnam Academy of Science and Technology issued Decisions 307/QD-VHL and 308/QD-VHL regarding the establishment and issuance of organizational operation regulations for the International Centre for Research and Postgraduate Training in Mathematics under the Institute of Mathematics.

- On December 31, 2021, the President of the Vietnam Academy of Science and Technology issued Decision 2681/QD-VHL regarding the issuance of organizational and operational regulations for the International Centre for Research and Postgraduate Training in Mathematics, replacing Decision 308/QD-VHL.

ii. Organizational structure and address of the Centre

- Former Director: On April 13, 2018, the President of the Vietnam Academy of Science and Technology issued Decision 558/QD-VHL appointing Prof. Dr. Pham Hoang Hiep as the director of the centre.

- Deputy Director: On August 21, 2020, the President of the Vietnam Academy of Science and Technology issued Decision 1286/QD-VHL appointing Assoc. Prof. Dr. Phan Thi Ha Duong as the deputy director of the centre.

- Current Director: On April 15, 2024, the President of the Vietnam Academy of Science and Technology issued Decision 778/QD-VHL appointing Assoc. Prof. Dr. Phan Thi Ha Duong as the director of the Centre, replacing Prof. Dr. Pham Hoang Hiep upon the completion of his term

- Permanent staff: The Institute of Mathematics transferred Prof. Dr. Ngo Viet Trung and Prof. Dr. Vu Ngoc Phat to serve as the heads of the Algebra and Optimization Research Group and the Control Theory Research Group at the centre, respectively.

- Part-time staff: Chief Accountant Tran Thi Thanh Ha, Secretary Khong Thi Phuong Thuy (2020-2024), Nguyen Thi Khuyen (01/2025-current).

- Centre's Address: 6th Floor, Building A6, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet, Cau Giay, Hanoi.

iii. Establishment of the Governing Board

The current Governing Board of the Centre consists of 05 members established by the President of the Vietnam Academy of Science and Technology according to Decision No. 1230/QD-VHL dated June 28, 2018, and amended by Decision No. 1705/DQQ-VHK, dated October 18, 2021:

- Ms. Le Quynh Lien, Head of International Cooperation Department, Vietnam Academy of Science and Technology, Chairperson.

- Ms. Nguyen Thi Thanh Ha, Deputy Head of the Department of Social Sciences and Humanities, representing the Ministry of Science and Technology, Member.

- Mr. Atish Dabholkar, Director of the Abdus Salam International Centre for Theoretical Physics, Member.

- Mr. Shaofeng Hu, Director (D-1) of the Division of Science Policy and Capacity Building in the Natural Sciences Sector, IBSP, Member.

- Mr. Phung Ho Hai, Institute of Mathematics, Member.

iv. Inauguration ceremony and presentation of the Governing Board

On October 29, 2021: The inauguration ceremony of the Mathematics and Physics Centres and of the Governing Board of the two Centres took place. The ceremony was attended by representatives of the National Commission for UNESCO of Vietnam, UNESCO Office in Vietnam, ICTP Centre, leaders of the Ministry of Science and Technology, leaders of the Vietnam Academy of Science and Technology. The event included two public lectures on the Nobel Prize in Physics and the Abel Prize in Mathematics.

v. Establishment of the Scientific Committee

Former Scientific Committee: On March 18, 2020, the President of the Vietnam Academy of Science and Technology issued Decision 333/QD-VHL regarding the establishment of the Scientific Committee of the Centre, including:

- Prof. Dr. Dinh Nho Hao, Chairman of the Scientific Committee;
- Prof. Dr. Nguyen Dinh Cong;
- Prof. Dr. Phung Ho Hai;
- Prof. Dr. Le Tuan Hoa;
- Prof. Dr. Vu Ngoc Phat;
- Prof. Dr. Nguyen Minh Tri;
- Prof. Dr. Ngo Viet Trung.

Current Scientific Committee: On July 10, 2024 the President of the Vietnam Academy of Science and Technology issued Decision 1657/QD-VHL regarding the establishment of the Scientific Committee of the Centre, including:

- Prof. Dr. Phùng Hồ Hải, Chairman of the Scientific Committee;
- Assoc. Prof. Dr. Nguyễn Tất Thắng, Deputy chair of the Scientific Committee;
- Assoc. Prof. Dr. Phạm Việt Hùng, Secretary of the Scientific Committee;
- Assoc. Prof. Dr. Đoàn Trung Cường;
- Assoc. Prof. Dr. Phan Thị Hà Dương;
- Assoc. Prof. Dr. Trần Giang Nam;
- Assoc. Prof. Dr. Vũ Thế Khôi;
- Prof. Dr. Đoàn Thái Sơn;
- Prof. Dr. Ngô Việt Trung.

vi. Issuance of regulations on the Centre's activities

- In 2020 and 2021, the Centre developed and implemented systematic regulations regarding scientific and technological task groups to support excellent training and research activities. The Centre also formulated regulations for organizing workshops and scientific

promotion activities, as well as establishing guidelines for cooperation and selecting collaborators to enhance its collaborative efforts.

- Decision No. 66/QD-VTH dated March 13, 2020, on Excellent Research Projects;
- Decision No. 178/QD-VTH dated September 30, 2020, on Young Talent Projects;
- Decision No. 177/QD-VTH dated September 30, 2020, on Outstanding Research Projects;

• Decision No. 146/QD-VTH dated July 26, 2020, on Excellent Young Scientist Projects (postdoc).

- The issuance of regulations for implementing training, capacity-building, cooperation, and dissemination activities of the Centre has been undertaken and issued by the Institute of Mathematics, numbered 185/QD-VTH on October 6, 2021.

2. Organization of training in mathematics at the international level

i. Providing Graduate-Level Mathematics Training through Classes and Short-Term Courses (such as summer schools, autumn schools, and similar formats) for Vietnamese citizens and individuals from other regional countries in need, as well as some African nations where mathematics is not yet fully developed.

- The Centre has organized international schools with the participation of many renowned professors at the Institute of Mathematics, VAST. During the COVID-19 pandemic, the Centre adapted by shifting to online formats.

- Results: The Centre has held 13 specialized schools with 35 international lecturers and 500 students from various countries, including Germany, France, Malaysia, Italy, Cambodia, Canada, China, Thailand, Indonesia, the Philippines, Brazil, the United Kingdom, Argentina, Japan, Romania, Iraq, Austria, Russia, the United States, Belgium, Greece, Hong Kong, Hungary, India, Lebanon, Uzbekistan, Turkey, Slovenia, and hundreds of scientists and students from Vietnam.

ii. Talent development and advanced training in mathematics for Vietnamese citizens and individuals from other regional countries in need, as well as certain African nations where mathematics is not yet fully developed.

- Experts from the Centre have participated in teaching activities in several countries in the region.

- Teaching at the CIMPA School "Current Trends in Algebra", held from January 29 to February 9, 2024, in the Philippines.

iii. Organizing postdoctoral training in mathematics through research programs, contributing to the development of young mathematicians into experts.

- The Centre has developed a postdoctoral research program, in which outstanding PhD holders from the region, internationally, and domestically undertake research projects in key areas. These projects may also involve renowned scientists from the Institute of Mathematics, as well as PhD students and trainees.

- Results: 11 research projects for outstanding PhDs have been supported: 9 projects have been successfully completed, 2 are ongoing, and 19 research papers have been published. Among them, 9 projects were led by outstanding PhDs from institutions outside the Institute of Mathematics.

iv. Developing Training Programs, Selection Procedures, and Financial Support Mechanisms for International Master's and Doctoral-Level Education in Mathematics through Scientific Research Projects and Programs.

- The Centre has selected research topics and created optimal conditions for scientists and students. We select outstanding students to carry out scientific research

projects, each supervised by a (Associate) Professor, with one or two students participating. Through these projects, students receive academic guidance and financial support for tuition and living expenses, enabling them to dedicate their full time to study and research.

- Results:
- A total of 20 research papers have been published.
- •There were 13 research projects for doctoral students; 12 have been successfully completed, 1 is ongoing, with 17 papers published.
- •14 research projects for young talents pursuing a master's degree, supporting 19 students: 14 projects have been successfully completed, with 5 research papers published.

3. Organization of mathematical research activities at the international level

i. Establishing research groups and research projects aimed at building strong research teams at both regional and international levels, with a focus on the participation of foreign mathematicians.

- Established two research directions led by two leading professors - Prof. Ngô Việt Trung and Prof. Vũ Ngọc Phát - working full-time at the centre.

- The centre develops outstanding research projects led by highly accomplished scientists in collaboration with reputable international experts. These research groups regularly organize specialized workshops and contribute to the training of many doctoral and master's students.

- Notably, the Research Group on Commutative Algebra led by Professor Ngô Việt Trung has attracted leading experts in the field and trained many outstanding doctoral students. The group has achieved prestigious awards, including the Ho Chi Minh Award (Prof. Ngô Việt Trung, Lê Tuấn Hoa, Nguyễn Tự Cường) and the Tạ Quang Bửu Award (Prof. Ngô Việt Trung and Dr. Nguyễn Đăng Hợp).

- Results: 2 consistent research directions and 12 outstanding research projects (8 projects successfully completed), with 48 papers in SCIE journals.

ii. Promoting Research Collaboration in Mathematics at Regional and International Levels through

- Consistently promoted the organization of international mathematics conferences with the participation of reputable scientists and many young researchers and students, including those from countries within the region. Despite the challenges posed by COVID, the centre has made efforts to conduct online conferences, focusing on the strengths of the mathematicians at the Institute.

- Results: Organized 8 international conferences with the participation of 250 leading experts and researchers from both domestic and international institutions.

4. Organization of international cooperation activities

i. Collaboration with IBSP of UNESCO, ICTP, and other scientific organizations aligned with UNESCO's programs. Collaboration with domestic and international universities with special attention to ASEAN countries, Asia-Pacific, and Africa, where mathematics is not yet well developed:

- Organized two meetings with professors from ICTP at the Centre to enhance scientific cooperation with ICTP in June, 2024 and December 2024.

- Professors from the Institute of Mathematics visited ICTP for exchanges and collaboration:

- Prof. Dr. Phạm Hoàng Hiệp worked and gave lectures at ICTP.
- Assoc. Prof. Phan Thị Hà Dương worked and gave lectures at University of Paris 6, Nice – Sophia Antipolis (2023), International Centre for Mathematical Sciences, Edinburgh (2023).
- Prof. Dr. Phùng Hồ Hải, Director of Scientific Committee, Member of the Centre worked at ICTP.
- In 2023, Prof. Dr. Ngô Việt Trung, in his role as Co-Chair of the Organizing Committee, participated in coordinating the workshop on Commutative Algebra at the International Centre for Theoretical Physics (ICTP).

ii. Research collaboration and mathematical applications with universities and research institutes domestically and internationally, with a focus on asean, asia-pacific, and African countries where mathematics is not yet fully developed. This includes: short-term expert exchanges, sending Vietnamese experts to teach short-term courses, participating in conferences and workshops, and hosting international experts and students for study and work at the Centre.

- The Centre has welcomed **4 international research groups** for scientific exchange: Algeria, India, Iran, Chile
- Thematic Semester: Since 2024, the Centé has launched a program of thematic semesters aimed at promoting in-depth academic exchange. The first thematic semester on Commutative Algebra, chaired by Prof. Dr. Lê Tuấn Hoa and held in the fourth quarter of 2024, attracted considerable interest and participation from international students. Building on this success, the next thematic semester is scheduled for September 2025, with the topic Arithmetic Geometry and Algebra, chaired by Prof. Dr. Phùng Hồ Hải.

iii. Collaboration with other UNESCO Category 2 Centres in the Field of Basic Sciences.

- The Centre collaborated with CIMPA to organize a Summer School for students, in partnership with several international universities, and has organized a total of 10 schools for both domestic and international students.

- The Centre sponsored a PhD researcher from Nigeria to work at the Center for two months in 2023 (co-sponsored by TWAS – The World Academy of Sciences for the advancement of science in developing countries).

iv. Fulfilling Other Obligations of a UNESCO Category 2 Centre (such as annual contributions, etc.).

- In previous years, the Centre was not required to pay an annual contribution to UNESCO. However, starting next year, the Centre will pay an annual fee of **USD 1,000**.

5. Organizing consultancy activities for policy makers, education experts and public propaganda on mathematics

i. Participation in advising policymakers and education experts in the field of mathematics.

- Policy consultation: Participation in the Asia-Pacific Women in Mathematics Conference, contributing to raising awareness of gender equality in mathematics and society. Successfully proposed opportunities for female mathematicians through the Vietnam Mathematical Society. - December 2021: Workshop on "Applied Mathematics in Digital Transformation of Agriculture, Food, and Rural Areas" in collaboration with the People's Committee of Thua Thien Hue Province to connect researchers, managers, businesses, and farmers towards eco- agriculture, modern rural areas, and smart farmers. Attended by the Vice Chairman of the People's Committee of Thua Thien Hue Province, Directors of Institutes of Hydraulics and Agricultural Sciences, and representatives from the Ministry of Agriculture and Rural Development, with 5 invited reports and panel discussions.

- April 2022: Continued collaboration with the Chairman of the People's Committee of Hue City and 5 leaders of Hue's departments on human resources training and promoting the development of mathematics.

ii. Organizing promotional activities for the public about mathematics, such as science fairs, public lectures, talent training classes, etc.

- A series of activities including public lectures and seminars on the achievements of mathematics and science, following the spirit of UNESCO, attracting more than 1,000 direct participants and 200,000 online viewers annually.

- International Mathematics Day: This day is held annually on March 14th and is registered on the IMD map. It is broadcast live, featuring public lectures and discussions on the significance and applications of mathematics, attracting young scientists and students from across the country.

- 2021: Mathematics for a Better World
- 2022: Mathematics Unites
- 2023: Mathematics for Everyone
- 2024: Playing with Math
- 2025: Mathematics, Art, and Creativity

- Vietnam Science and Technology Day: Held annually on May 18th, in the years 2021, 2022, 2023, and 2024.

- Econometrics Olympic Competition: Featuring over 130 topics from 30 universities, held in the years 2021, 2022, 2023, and 2024.

iii. Organizing events to commemorate or support UNESCO's initiatives on basic science. (In collaboration with the National UNESCO Committee of Vietnam, UNESCO Office in Hanoi). Refer to Chapter III.

6. Ensure conditions for activities of the Centre

i. Allocating annual operating funds from the state budget for the Centre

- The operating budget of the Centre is provided annually by the Vietnam Academy of Science and Technology with an allocation of 5 billion VND (210 000 USD).

ii. Ensuring equipment, infrastructure, and other resources

- The Institute of Mathematics has allocated the entire 6th floor, Building A6 (within the premises of the VAST to the Centre, including 10 offices and 2 classrooms/seminar rooms. The Institute of Mathematics Library (considered the richest mathematics library in Vietnam) also allows all Centre trainees to use it as Institute staff.

- The Centre allocates part of its budget to invest in purchasing equipment for research and teaching activities, such as desks, chairs, cabinets for office space, meeting rooms, seminar rooms, classrooms, bookshelves for training and research, as well as to maintain the Centre's regular activities.

- The Centre has implemented the construction of a bilingual electronic newsletter (http://icrtm.vast.vn) in Vietnamese and English to regularly update information on the organization and activities of the Centre.

iii. Mobilizing other funding sources beyond the state budget for the activities of the International Center of Research and Postgraduate Training in Mathematics, receiving donations, aid, and gifts from individuals and organizations both domestically and internationally

- Co-organized with the Vingroup Innovation Foundation many events such as Mathematics Day, Science and Technology Day, with financial contributions from both entities.

- Co-organized with the People's Committee of Thua Thien Hue province to deploy a working delegation for collaboration, with financial contributions from both entities.

7. Meeting and Reporting Mode

i. The Governing Board meetings

- October 29, 2021: Inauguration event for the Mathematics and Physics Centres and the inauguration of the Governing Board of the two Centres.

- Successfully organized the international Governing Board meeting of the ICRTM and ICP, with participation from international and Vietnamese members, held on 10 October 2023 at the VAST. The meeting approved the activity program for the following year.

* Onsite participants:

Governing Board Members:

1. Dr. Le Quynh Lien, Director of International Cooperation Department - VAST, Chairwoman of the Boards;

2. Dr. Nguyen Thi Thanh Ha, Deputy Director, Department for Natural, Social and Human Sciences - MOST, Representative of MOST in the Governing Boards;

3. Prof. Dr. Phung Ho Hai, Institute of Mathematics - VAST, Member of the Governing Board of ICRTM;

4. Prof. Dr. Nguyen Dai Hung, Institute of Physics - VAST, Member of the Governing Board of ICP.

Directorate of ICP and ICRTM:

1. Prof. Dr. Pham Hoang Hiep, Director ICRTM;

2. Assoc. Prof. Dr. Phan Thi Ha Duong, Deputy Director ICRTM;

3. Assoc. Prof. Dr. Dinh Van Trung, Director ICP;

4. Dr. Do Hoang Tung, Deputy Director ICP.

Other participant:

1. Dr. Nguyen Le Minh, Depute Director, Department of Planning and Finance;

2. Assoc. Prof. Dr. Doan Thai Son, Director of Institute of Mathematics - VAST;

3. Mr Tran Nam Binh, Specialist of Subcommittee on Natural Science - MOST;

4. Ms Tran Minh Trang, Specialist of International Cooperation Department - VAST, Secrectary of the meeting;

* Online participants:

Governing Board Members:

1. Prof. Shaofeng Hu, Director, Department of Science Policy and Basic Sciences, Natural Sciences, UNESCO, Representative of UNESCO in the Governing Boards;

2. Prof. Claudio Arezzo, Head of the Mathematics Section at ICTP, Representative of UNESCO in the Governing Boards;

Other participants:

1. Dr. Nguyen Hoang Duong, Deputy Director of International Cooperation Department - VAST;

2. Mr. Nguyen Tuan Khanh, Representative of the Vietnam National Commission for UNESCO;

3. Ms Tran Lan Huong, Director, Department of Natural Sciences, UNESCO - Hanoi;

4. Ms Trinh Quynh Trang, Specialist of International Cooperation Department, MOST; *Conclusion of the meeting:

• The Governing Boards highly appreciated the progress and commitment demonstrated by ICP and ICRTM.

It was recommended that the Centres:

+ Strengthen engagement with ASEAN and UNESCO-affiliated networks to broaden international impact.

+ Invest in scientific infrastructure and foster a supportive environment for young and female scientists.

+ Prepare actively for joint events, including the Vietnam Physics Day and the ICTP 60th Anniversary Celebration in 2024.

+ Pursue innovative research topics, particularly those aligned with UNESCO's global priorities, and maintain transparency and excellence in reporting and planning.

• The Chairwoman concluded the meeting by thanking all participants for their constructive input and reaffirmed VAST's dedication to ensuring the Centres' continued success.

- May 3, 2024: The International Executive Board meeting of the ICRTM and ICP Centres, with the participation of international and Vietnamese members, representatives from the Ministry of Science and Technology, the Vietnam Academy of Science and Technology, the Vietnam UNESCO Committee, and UNESCO representatives in Hanoi. The meeting evaluated the excellent performance of both centers over the past period and approved full support for the extension of the two centres.

* Onsite participants:

Governing Board Members:

1. Dr. Le Quynh Lien, Director of International Cooperation Department - VAST, Chairwoman of the Boards;

2. Dr. Nguyen Thi Thanh Ha, Deputy Director, Department for Natural, Social and Human Sciences - MOST, Representative of MOST in the Governing Boards;

3. Prof. Dr. Phung Ho Hai, Institute of Mathematics - VAST, Member of the Governing Board of ICRTM;

4. Prof. Dr. Nguyen Dai Hung, Institute of Physics - VAST, Member of the Governing Board of ICP.

Directorate of ICP and ICRTM:

1. Assoc. Prof. Dr. Phan Thi Ha Duong, Director ICRTM;

2. Assoc. Prof. Dr. Dinh Van Trung, Director ICP;

3. Dr. Do Hoang Tung, Deputy Director ICP.

Other participants:

1. Dr. Nguyen Le Minh, Depute Director, Department of Planning and Finance;

2. Assoc. Prof. Dr. Doan Thai Son, Director of Institute of Mathematics - VAST;

3. Ms Vu Thi Tu Quyen, Deputy Director of International Cooperation Department, MOST;

4. Ms Trinh Quynh Trang, Specialist of International Cooperation Department, MOST;

5. Mr Nguyen Nam Khanh, Specialist of The Vietnam National Commission for UNESCO;

6. Ms Tran Minh Trang, Specialist of International Cooperation Department - VAST, Secrectary of the meeting;

* Online participants:

Governing Board Members:

1. Prof. Shaofeng Hu, Director, Department of Science Policy and Basic Sciences, Natural Sciences, UNESCO, Representative of UNESCO in the Governing Boards;

2. Mr. Atish Abholkar, Director of the Abdus Salam International Centre of Theoretical Physics (ICTP), Representative of UNESCO in the Governing Boards;

3. Prof. Claudio Arezzo, Head of the Mathematics Section at ICTP;

4. Prof. Ralf Kaiser, Head of Programmes at ICTP.

Other participants:

Ms Tran Lan Huong, Director, Department of Natural Sciences, UNESCO – Hanoi Office. *Conclusions and Recommendations

• The Governing Boards unanimously endorsed the extension of the Agreements establishing ICP and ICRTM as UNESCO Category 2 Centres under the auspices of UNESCO.

The following recommendations were made:

• The Centers should finalize and supplement their extension dossiers following UNESCO's updated guidelines, ensuring clear articulation of how their activities contribute to UNESCO's outcomes and global priorities.

• A detailed timeline should be developed to guide the extension process, structured around four main stages: internal preparation, national endorsement, submission to UNESCO, and UNESCO Executive Board approval.

• A formal request for extension should be submitted to UNESCO no later than September 2024, after obtaining authorization from the relevant Vietnamese authorities. 5

• Efforts should be made to organize a high-profile event in 2024, celebrating the extension of the two Centers and commemorating the 60th Anniversary of ICTP.

The Chairwoman thanked all participants for their valuable contributions and reaffirmed VAST's commitment to supporting the continued development of ICP and ICRTM as centers of scientific excellence.

- May 10, 2024: The meeting on the extension of the two centres, with the participation of Deputy Minister of Science and Technology Tran Hong Thai, Vice President of the Vietnam Academy of Science and Technology Chu Hoang Ha, Secretary-General of the Vietnam UNESCO Committee Le Thi Hong Van, along with many representatives from various ministries and agencies. The meeting assessed the centers as having accomplished their tasks excellently, with a need to enhance and expand their activities. Full support for the extension of both centers was given.

ii. Reports

- Each year, the completed report is submitted to the National Commission for UNESCO in Vietnam and to UNESCO's International Basic Sciences Program (IBSP).

- At the end of each year, the Centre participates in and reports at the annual review meeting of VAST and of the Ministry of Science and Technology.

- In November 2023, the Centre attended and delivered speeches at the UNESCO General Conference in Paris, followed by discussions with members of the Centre's Governing Board.

- On May 3, 2024: The International Executive Board of ICRTM and ICP, with the participation of international and Vietnamese members, including representatives from the Ministry of Science and Technology of the Vietnam Academy of Science and Technology, the UNESCO Committee in Vietnam, and the UNESCO Office in Hanoi. The meeting

evaluated the excellent performance of both centers during the past period and approved and fully supported the extension of both centers.

- On May 10, 2024: Meeting regarding the extension of the two centres, attended by Deputy Minister of the Ministry of Science and Technology, Vice President of the Vietnam Academy of Science and Technology, Secretary-General of the UNESCO Committee in Vietnam, and representatives from various departments. The meeting acknowledged the outstanding completion of tasks by both centers and emphasized the need to enhance and expand their activities. Full support was given for the extension of both centres.

- From May 15-17, 2024, representatives from the Governing Board and two Centres attended the "International Symposium of Category 2 Centres under the Auspices of UNESCO in the Field of Natural Sciences" organized by UNESCO in Malaysia. The symposium provided an opportunity for leaders of Category 2 Centres to report to UNESCO on their activities, exchange information, and build collaborations. The Director of the Mathematics Centre delivered a speech at the symposium and participated in the Roundtable "Session 6: The Role of Basic Sciences in Advancing Emerging Technologies and Breakthrough Innovations." Additionally, the director of the centre presented about the Center to the Deputy Director-General of UNESCO, the Minister of Education, and the Minister of Science, Technology, and Innovation of Malaysia, discussing the Center and the opportunities for cooperation between the centers of the two countries.

- October 12-25, 2024: The Director of the Centre participated in the 220th session of the UNESCO Executive Board. During this session, the Director of the Centre, along with representatives from the Ministry of Science and Technology of Vietnam, met with Mr. Shaofeng Hu, Director (D-1) of the Science Policy and Capacity Building Section in the Natural Sciences field, and the representative of IBSP to discuss the extension and development plans for the Centre.

- On September 10, 2024, the International Centre of Research and Postgraduate Training in Mathematics hosted Mrs. Lidia Brito, Assistant Director-General for Natural Sciences at UNESCO.

- On November 29–30, 2024, the Centre, in cooperation with the Institute of Mathematics, VAST, and ICTP, organized the 60th Anniversary Celebration of ICTP, with the participation of the Director of ICTP, VAST leaders, ministry representatives, and experts and scientists from various research institutes and universities.

III. CONTRIBUTION TO SPREADING THE SPIRIT OF UNESCO

1. Contribution to the 17 Sustainable Development Goals (SDGs) and other international development agandas

- The centre has organized over 20 major events, attracting about 2000 direct participants, over 300,000 online views, and coverage in 100 articles and television broadcasts. Reputable scientists, cultural researchers, historians, and artists have contributed to various workshops, conferences, and public lectures aimed at raising awareness in the community about the 17 Sustainable Development Goals (SDGs). Each event deeply explores a specific theme, focusing on:

- Quality education
- •Gender equality
- •Climate change adaptation
- Knowledge dissemination
- Access to clean energy

- Environmental Science and Technology Day, in collaboration with the International Centre of Physics and the UNESCO Biosphere Centre Vietnam, May 18, 2021.

- Vietnam Book Day, April 20, 2021: Connecting scientific and technological fields with social sciences and humanities.

- Exhibition "Agent Orange Disaster – 60 Years Later", July-August 2021, Military History Museum, Hanoi co-organized with the Chemical Corps – Ministry of National Defense and Vingroup Innovation Foundation resentating of mathematical models. More than 20 news articles and reports.

- Cooperation with the French Embassy to organize the Sustainable Cities Program: a series of public lectures on Sustainable Cities in November 2021, June 2022, and December 2022.

- Open Science Day: In cooperation with the Ministry of Science and Technology, the Ministry of Information and Communications, the International Centre of Physics, the conference titled "OPEN SCIENCE - From Different Perspectives" was organized on May 18, 2023.

- UNESCO's Sustainable Development Goals Day - August 24, 2023: With the participation of international and Vietnamese scientists, cultural and social experts, leaders of several agencies under the Ministry of Science and Technology and research institutes, as well as leaders of some businesses, on August 24, 2023.

- Participation in the Seminar "20 Years of Protecting Intangible Cultural Heritage in Vietnam: From UNESCO to the Community" (12/2023) - Through this, cooperation was exchanged with the Head of the Vietnamese Delegation to UNESCO, scientists, and managers from the Vietnam Heritage Association regarding future cooperation on several UNESCO programs.

- On May 10, 2024: The Science and Technology Day "Cooperation and Development btween Centers and UNESCO's Natural Science Programs" organized by the two centers, with the participation of Deputy Minister of the Ministry of Science and Technology Tran Hong Thai, Vice President of the Vietnam Academy of Science and Technology Chu Hoang Ha, Secretary-General of the UNESCO Committee in Vietnam Le Thi Hong Van, along with many directors of centers and UNESCO programs. Deputy Minister Tran Hong Thai commented: "The establishment of the two centers has been a correct direction contributing to the achievements of the science and technology sector over the past 65 years."

- March 13, 2025: International Mathematics Day: "Mathematics, Art, and Creativity". Mathematics will be explored through two public lectures and a roundtable discussion, featuring speakers and mathematicians alongside physicists and social scientists, offering diverse perspectives.

2. Incorporate gender considerations in education, sustainable development, and policy-making

- Female researchers or trainees are always encouraged at the Centre.

- Gender equality factors have been considered in the centre's regulations, such as prioritizing age for women in some young scientific topics.

- Writing articles on gender equality and gender equity in Vnexpress newspaper.

- Attending the "Opening meeting of Asian-Pacific Women in Mathematics (AOWM), 2023".

- Invited speaker at the Workshop on Gender Equality organized by the French Embassy to commemorate 50 years of France-Vietnam relations. March 8, 2023.

- Guest speaker at the panel discussion "International Women's Day - Dialogue among inspiring women", organized by the French Institute in Vietnam in Ho Chi Minh City. March 8, 2024.

- Successfully proposed with the Vietnam Mathematical Society to implement special regulations for women, such as granting 30 scholarships to female mathematics lecturers to attend the 10th National Mathematics Conference in August 2024.

Beneficiaries	Category	Number (estimate)
	1. Projects for outstanding research	Male: 12
	2 Projects for PhD students	Female students: 9
	2. Projects for Fild students	Male students: 4
(usuggrogueu by sex)	3 Projects for Postdoctoral researchers	Female researchers: 3
	5. Projects for Postdoctoral researchers	Male researchers: 8
	4. Projects for young students in	Female students: 4
	mathematics	Male students: 15

IV. CHALLENGES AND LESSONS

1. The main challenges faced in implementation and how they were addressed

- To overcome the challenges during the early years of the pandemic, the Centre organized online courses and workshops. This also opened up opportunities for a combination of in-person and online activities, attracting a larger audience.

- There aren't many categories 2 centres operating strongly worldwide, especially during the COVID pandemic. To overcome this, we plan to visit and participate in exchanges with other centres more often to promote collaborations.

2. Lessons learned

- The Ministry of Science and Technology and the Vietnam Academy of Science and Technology have always shown interest in and supported the Centre. The Ministry of Science and Technology has promptly and significantly focused on developing proposals for the Prime Minister's approval of the Centre's operational plan. It can be said that the provisions in the proposal and plan have been flexible to enable the Centre to operate substantially and effectively.

- Based on the approved operational plan by the Prime Minister, the Centre has established regulations regarding research topics for doctoral training, topics for training master's talents, and notably topics for outstanding young scientists' post-doctoral research. This is also a way to provide opportunities for outstanding young talents to study and conduct research.

- The scientific and technological revolution has demonstrated the necessity of applied mathematics. The Centre has actively introduced mathematics and its applications to young science and technology enthusiasts. Additionally, the Centre is gradually establishing collaborations to develop applied mathematics.

V. FUTURE PLANS AND DEVELOMENT PROSPECTS OF THE CENTRE

The centre will leverage the achievements already made while supplementing additional activities to further excel in the contents outlined in the approved Activity Plan by the Prime Minister:

- Continuously leverage the successes achieved in supporting scientific research and excellent training, **supplementing the Topic-based Project Program with reputable** scientists from Vietnam and around the world collaborating for 2 - 6 months (following the tradition of major scientific centres worldwide).

- Continue to build on the successes achieved in training activities. In collaboration with the University of Science and Technology Hanoi (USTH), develop an international Master's program in Mathematics. Partner with the International Centre for Theoretical Physics (ICTP) in the training of Master's students, PhD candidates, and interns.

- Continuously strengthen international cooperation activities, especially through diplomatic representatives, international organizations in Vietnam. Supplement the coorganization and visits to other Category 2 research centres in the region and worldwide.

- Actively promote scientific outreach activities: scientific events, public lectures reaching out to scientists, students, and pupils; particularly disseminate UNESCO's 17 Sustainable Development Goals, supplementing topics on digital transformation, ethics in artificial intelligence.

- Support activities connecting mathematics with other fields of science, technology, social sciences, and humanities: support the development of applied mathematics models in disease prevention, environment, agriculture. Supplement additional cooperation activities with other UNESCO programs in Vietnam.

- Contribute opinions to policymakers on mathematics-related issues, applied mathematics (when requested). Actively participate in activities proposed by the Ministry of Science and Technology, the Vietnam Academy of Science and Technology, and the UNESCO Committee.

VI. CONCLUSION AND PROPOSAL

- The Centre has completed all 7 tasks according to Decision No. 701/QD-TTg. and has closely followed the objectives outlined in the Agreement between the Government of Vietnam and UNESCO. Among these, the most prominent tasks include scientific development (evidenced by 82 publications in reputable journals and strong research groups), the mission of providing internationally accredited mathematics training with significant support for students both domestically and internationally to participate in international schools, and the dissemination of UNESCO's principles. In the upcoming period, the Centre will continue to leverage these strengths and further enhance international cooperation as well as exchanges with other category 2 centres.

- This agreement has been effective from 2020 to 2026 and requires an extension to continue. In order to achieve these goals and further advance the objectives outlined in the current agreement, the center recommends extending the agreement for the next term starting from 2026. The centre hopes to be provided with all necessary favorable conditions for the evaluation and development of the extension agreement to proceed smoothly and efficiently.

Director

Phan Thị Hà Dương

APPENDICES

Appendix I: Centre's Finances (Unit of measurement: Million VND)

Year 2020

No.	Description	Budget
1	International Conferences, Seminars	163
2	International Summer Schools	200
3	Media and Public Relations Activities	200
4	Training through Research	700
5	Outstanding Research Projects	200
6	Research Development Projects	883
7	Outbound and Inbound Delegations	107
8	Purchase of Books, Journals, and Magazines for Research	180
9	General Activities	280
	Total	2.913

Year 2021

-Amount transferred from 2020 to 2021: 1.099.000.000 VND

-Budget transferred from 2020: 1.099.000.000 VND

-Approved budget for 2021: 5.000.000.000 VND

-Budget used in 2021: 5.410.000.000 VND

No.	Description	Budget
1	International Conferences, Seminars	200
2	International Summer Schools	300
3	Media and Public Relations Activities	200
4	Training through Research	2.470
5	Outstanding Research Projects	1.410
6	Outbound and Inbound Delegations	
7	Purchase of Books, Journals, and Magazines for Research	310
8	Purchase of Equipment and Facilities	120
9	General Activities	400
	Total	5.410

Year 2022

No.	Description	Budget
1	International Conferences, Seminars	50
2	International Summer Schools	100
3	Media and Public Relations Activities	150
4	Training through Research	3.000
5	Outstanding Research Projects	1.000
6	Outbound and Inbound Delegations	60
7	Purchase of Books, Journals, and Magazines for Research	310
8	General Activities	330
	Total	5.000

Year 2023

No.	Description	Budget
1	International Conferences, Seminars	250
2	International Summer Schools	200
3	Media and Public Relations Activities	150
4	Training through Research	2.214
5	Outstanding Research Projects	1.250
6	Outbound and Inbound Delegations	260
7	Purchase of Books, Journals, and Magazines for Research	180
8	General Activities	410
	Total	4.914

Year 2024

- Transferred Budget from 2023: 85.561.709 VND

-Approved Budget for 2024: 5.000.000.000 VND

-Actual Budget Used in 2024: 3.795.971.709 VND

No.	Description	Budget
1	International Conferences, Seminars	202
2	International Summer Schools	362
3	Media and Public Relations Activities	101
4	Training through Research	1.382
5	Outstanding Research Projects	746
6	Outbound and Inbound Delegations	283
7	Purchase of Books, Journals, and Magazines for Research	104
8	General Activities	616
	Total	3.796

Plan for 2025

No.	Description	Budget
1	International Conferences, Seminars	786
2	International Summer Schools	280
3	Media and Public Relations Activities	240
4	Training through Research	308
5	Outstanding Research Projects	652
6	Outbound and Inbound Delegations	785
7	Purchase of Books, Journals, and Magazines for Research	765
8	General Activities	750
	Total	4.566

Authority Responsible for Evaluating the Centre's Financial Activities

According to the approved settlement records for each year, the operational budget of the International Centre for Research and Training in Mathematics has been approved by the Vietnam Academy of Science and Technology. The settlement process and implementation have been carried out on schedule, in line with the approved plan, and in compliance with current regulations. The financial figures approved by the Vietnam Academy of Science and Technology are as follows:

- 2020: 2.913.100.000 VND;
- 2021: 5.410.000.000 VND;
- 2022: 5.000.000.000 VND;
- 2023: 4.914.440.000 VND.

Appendix II: List of donors and project partners

1. Donors:

- Vingroup Innovation Foundation VINIF, Institute of Big Data, Vietnam:
 - + 2021: 30 million VND
 - + 2022: 30 million VND
 - + 2023: 30 million VND
 - + 2024: 30 million VND
 - + 2025: 50 million VND
- Hanoi Pedagogical University 2, Vietnam, 2025, 150 million VND.

2. Đối tác dự án

- -Institute of Mathematics, Vietnam Academy of Science and Technology, Vietnam;
- Vingroup Innovation Foundation VINIF, Institute of Big Data, Vietnam;
- Hanoi Pedagogical University 2, Vietnam;
- Centre International de Mathématiques Pures et Appliquées;
- The Abdus Salam International Centre for Theoretical Physics;
- Hue City Portal;
- Dalat University, Da Lat, Vietnam;
- Quy Nhon University, Binh Dinh, Vietnam;
- Khanh Hoa University, Nha Trang, Vietnam;
- Vietnam Institute for Advanced Study in Mathematics.

1. Governing Board

- Dr. Lê Quỳnh Liên, Director of Department of International Co-Operation, Vietnam Academy of Science and Technology, Head of Department.

- Dr. Nguyễn Thị Thanh Hà, Deputy Director, Department of Natural, Social, and Human Sciences, A representative from the Ministry of Science and Technology of Vietnam, Member.

- Dr. Atish Dabholkar, Director, the Abdus Salam International Centre for Theoretical Physics, Member.

- Prof. Shaofeng Hu, Director (D-1) of the Division of Science Policy and Capacity Building in the Natural Sciences Sector, IBSP, Member.

- Prof. Phung Ho Hai, Institute of Mathematics, Member.

2. Scientific Committee

- Prof. Dr. Phùng Hồ Hải, Chairman of the Scientific Committee;

- Assoc. Prof. Dr. Nguyễn Tất Thắng, Deputy chair of the Scientific Committee;

- Assoc. Prof. Dr. Phạm Việt Hùng, Secretary of the Scientific Committee;
- Assoc. Prof. Dr. Đoàn Trung Cường;
- Assoc. Prof. Dr. Phan Thị Hà Dương;
- Assoc. Prof. Dr. Trần Giang Nam;
- Assoc. Prof. Dr. Vũ Thế Khôi;
- Prof. Dr. Đoàn Thái Sơn;
- Prof. Dr. Ngô Việt Trung.

3. Centre Collaborator

- Prof. Dr. Ngô Việt Trung;
- Prof. Dr. Vũ Ngọc Phát.

4. Concurrent Staff

- Assoc. Prof. Dr. Phan Thị Hà Dương;
- Prof. Dr. Phạm Hoàng Hiệp;
- Assoc. Prof. Dr. Cấn Văn Hảo;
- Dr. Đinh Sĩ Tiệp;
- Assoc. Prof. Dr. Trần Nam Trung;
- Assoc. Prof. Dr. Đỗ Hoàng Sơn;
- Mrs. Trần Thị Thanh Hà;
- Mrs. Nguyễn Thị Khuyên.

Appendix IV: Table of beneficiaries, individuals trained, and countries receiving support **1. Postdoctoral fellows supported through research projects**

No.	Project Name	Project Leader	Result(s)	Project Timeline	Institution/University
	Total		19 SCIE articles		
1	Random Walks and Algorithms for Community Detection in Networks	Đỗ Duy Hiếu	01 SCIE article	2021 – 2023	Institute of Mathematics
2	Partial Differential Equation with Dispersion on the Background of One- Dimensional Soliton Pair	Lương Thái Hưng	01 SCIE article	2021 – 2023	Institute of Mathematics
3	The Variational Method in the Study of Degenerate Elliptic Equations	Dương Trọng Luyện	5 SCIE articles	2021 – 2023	Hoa Lư University, Ninh Binh province
4	Some Invariants of Monomial Ideals	Nguyễn Thu Hằng	01 SCIE article	2021 – 2023	Thai Nguyen University
5	The coarse geometry of the Croke-Kleiner group is admissible	Nguyễn Thanh Hoàng	3 SCIE articles	2021 – 2023	Danang University
6	Singular form for partial differential equations	Dương Giao Kỵ	3 SCIE articles	2021 – 2023	An Giang University
7	Half-algebraic geometry and limits of rational functions	Nguyễn Hồng Đức	02 SCIE articles	2021 – 2023	Thăng Long University
8	Gromov-Hausdorff stability for dynamical systems generated by Parabolic equations	Nguyễn Ngọc Thạch	01 SCIE article	2022 – 2023	Danang University
9	Stochastic differential equations and their applications	Phan Thanh Hồng		2024-2025	Thăng Long University
10	Convex hull approximation of a finite set of points	Nguyễn Kiều Linh		2024-2025	Posts and Telecommunications Institute of Technology
11	Some selected issues on conformal maps	Phạm Hồng Nam	02 SCIE articles	2024	Thai Nguyen University

No.	Project Name	Project Leader	Member	Result(s)	Project Timeline
	Total	17 SCIE articles			
1	Efficient algorithm to find the smallest connected orthogonal convex hull of a finite set of points in the plane	Phan Thành An	Nguyễn Thị Lê	01 SCIE article	2020 – 2022
2	Some inverse problems for elliptic equations	Đinh Nho Hào	Lê Thị Thu Giang	01 SCIE article	2020 - 2022
3	Necessary and sufficient conditions for assigning a binary spectrum to a time-varying linear control system	Đoàn Thái Son	Lê Viết Cường	02 SCIE articles	2020 – 2022
4	Asymptotic dynamics for Young-type stochastic equation systems	Lưu Hoàng Đức	Phan Thanh Hồng	01 SCIE article	2020 - 2022
5	Some issues concerning three-degree four- dimensional manifolds	Hoàng Lê Trường	Hoàng Ngọc Yến	02 SCIE articles	2020 - 2022
6	The Moment Problem and Positive Representations on a Class of Semi-Algebraic Sets and Applications	Hồ Minh Toàn	Dư Thị Thu Trang	03 SCIE articles	2021 – 2023
7	The regular index of the form power of a monomial ideal	Trần Nam Trung	Trương Thị Hiên	01 SCIE article	2021 - 2023
8	Stability problem in finite time and control of large-scale degenerate systems with delays	Vũ Ngọc Phát	Phạm Thị Hương	01 SCIE article	2022 - 2023
9	Some number-theoretic topics on function fields	Phùng Hồ Hải	Phạm Lan Hương	01 SCIE article	2022 - 2023
10	Some issues related to Mukai manifolds	Hoàng Lê Trường	Nguyễn Thị Ánh Hằng	01 SCIE article	2022 - 2023
11	Asymptotic behavior of	Hoàng Thế	Hà Đức	01 SCIE	2022 - 2023

2. List of outstanding PhD students supported through research projects

	solutions to systems of equations with	Tuấn	Thái	article	
	derivatives				
12	First and second-order optimality conditions for a class of optimal control problems with parabolic equations, subject to nonlinear constraints mixing state and control variables	Bùi Trọng Kiên	Huỳnh Khanh	02 SCIE articles	2022 – 2024
13	Limit Theorems for Applied Stochastic Models	Phạm Việt Hùng	Nguyễn Chỉ Dũng		2024-2025

No.	Project Name	Project Leader	Member	Result(s)	Project Timeline
	Total			9 Preprints, 5 Articles	
1	Crystalline Cohomology and Isocrystals	Phùng Hồ Hải	Võ Quốc Bảo, Nguyễn Khánh Hưng	01 Preprint	2020 – 2022
2	Field of Values of Irreducible Characters of Certain Finite Groups	Đoàn Trung Cường	Quản Thị Hoài Thu	01 Preprint	2020 – 2022
3	Fluctuations in Osmosis Models	Cấn Văn Hảo	Nguyễn Văn Quyết, Vũ Hồng Sơn	01 Preprint	2020 – 2022
4	Limit Theorems for Certain Random Models	Phạm Việt Hùng	Nguyễn Chỉ Dũng	01 Preprint	2020 – 2022
5	Formal Powers of Monomial Ideals	Nguyễn Đăng Hợp	Lê Minh Thuận	01 Article	2020 – 2022
6	Arithmetic of Algebraic Tori and Unipotent Groups	Nguyễn Quốc Thắng	Nguyễn Quang Khải	01 Preprint	2021 – 2023
7	Irreducible Representations of the Leavitt Path Algebra of a Hypergraph	Trần Giang Nam	Nguyễn Đình Nam	01 Article	2021 – 2023
8	Laplace Transform, Final Value Theorem, and Applications in the Asymptotic Behavior of Solutions to Certain Classes of Fractional Differential Equations	Hoàng Thế Tuấn	Hà Đức Thái Tống Thị Thảo	01 Article	2022 – 2023
9	Selected Problems in Model Learning	Đinh Nho Hào	Lê Ngọc Quỳnh; Dương Xuân Hiệp	01 Preprint	2022 – 2023
10	Asymptotic Behavior of Solutions to Systems of Positive Coupled Equations with Multiple Fractional Orders and Variable Delays	Hoàng Thế Tuấn	La Văn Thịnh	01 Article	2022 – 2023
11	Scanning Process with Velocity Constraints	Nguyễn Đông Yên	Nguyễn Năng Thiều	01 Article	2022 – 2023

3. List of young talents supported through the research projects

12	The relationship between the normality of a monomial ideal and the property of integer rounding up	Ngô Việt Trung	Đỗ Hoàng Việt	01 Preprint	2022 – 2024
13	The method of linear algebra in network community detection algorithms	Đỗ Duy Hiếu	Nguyễn Phan Minh Bùi Quốc	01 Preprint	2024
14	The Euclidean distance degree of algebraic sets	Nguyễn Tất Thắng	Phạm Thu Thúy	01 Preprint	2024

No.	Project Name	Project Leader	Result (s)	Project Timeline
Total			20 SCIE articles	
1	Some Issues on the Depth Function of Monomial Ideals	Ngô Việt Trung	01 SCIE article	2020 - 2022
2	Arc Spaces, Differential Algebra, and Motivic Integration	Phùng Hồ Hải	02 SCIE articles	2020 - 2022
3	Some Qualitative Properties of Optimization Problems and Dynamical Systems and Their Applications	Nguyễn Đông Yên	03 SCIE articles	2020 - 2022
4	Some Selected Problems in the Theory of Fractional Differential Systems	Hoàng Thế Tuấn	02 SCIE articles	2020 - 2022
5	Optimality Conditions and Numerical Methods for Nonsmooth Optimal Control Problems Governed by Partial Differential Equations	Bùi Trọng Kiên	03 SCIE articles	2021 - 2022
6	Selected Topics in Partial Differential Equations	Nguyễn Minh Trí	01 SCIE article	2021 - 2022
7	Arithmetic of Algebraic Groups and Galois Cohomology	Nguyễn Quốc Thắng	02 SCIE articles	2021 - 2022
8	The Exel–Effros–Hahn Conjecture for Certain Steinberg Algebras	Trần Giang Nam	02 SCIE articles	2022 - 2023
9	Some Problems in Singularity Theory and Nonsmooth Analysis	Đinh Sĩ Tiệp	03 SCIE articles	2022 - 2024
10	Stability and Regularity of Solutions to the Complex Monge-Ampère Equation	Đỗ Hoàng Sơn	01 SCIE article	2023 - 2025
11	Asymptotic Behavior of Interacting Particle Systems	Cấn Văn Hảo		2024- 2026
12	Some Problems on the Castelnuovo-Mumford Regularity of Symbolic Powers of Square-Free Monomial Ideals	Trần Nam Trung		2024- 2025

4. Strong research groups through excellent research brok

No.	Conference name	Attendees (In-person/Online)	Year Organized	Foreign participants
	Total	650/70		227
1	International Workshop on "Ordinary Differential Equations and Dynamical Systems", July 24, 2020, Venue: Institute of Mathematics	20/10	2020	5 (China (02); Thailand (01); Indonesia (02))
2	Conference on "Tannakian Categories", Hanoi, August 23-26, 2021	20/20	2021	5 (France (02); Germany (01); UK (2))
3	1st Scientific Conference on "Applied Mathematics in Agriculture, Food, and Rural Development", Hue, December 4, 2021	20/20	2021	5 (France (03); Germany (2))
4	International Conference on Discrete Mathematics and Computer Science (ICDMCS), Dalat, Vietnam, December 1-2, 2022	50	2022	5 (US (02); Thailand (01); Indonesia (02))
5	International Conference: "Pole of the Bizarre and Some Related Issues", Quy Nhon, Binh Dinh from September 11 to September 15, 2023.	30/20	2023	16 (US (02); Thailand (01); Indonesia (02); Laos(3); Cambodia (2); France (3); Germany (2); Belgium (1))
6	International Conference: The International Workshop on Matrix Analysis and its Applications, Quy Nhon, Binh Dinh from July 07 to July 08, 2023.	50	2023	21 (US (02); Thailand (04); Indonesia (03); Laos(3); Cambodia (2); France (3); UK (4))
7	Workshop: The 11th Japan- Vietnam Joint Seminar on Commutative Algebra, Hanoi, March 28-30, 2023	50	2023	20 (Japan (20))

5. List of international conferences

8	Workshop on Commutative Algebra and Related Combinatorial Structures	50	2024	19 (Philippines (04); Indonesia (03); Laos (3); Cambodia (2); France (3); UK (4))
9	Matrix Analysis and Quantum Information Theory in 2024	40	2024	19 (France (3); Germany (2); Belgium (1); Italia (4); India (5); Japan (2); Korea (2))
10	Singularities and Algebraic geometry	40	2024	24 (Laos (3); Cambodia (2); France (3); Germany (2); Belgium (1); Italia (4); India (5); Japan (2); Korea (2))
11	The 3rd Vietnam - Korea joint workshop on selected topics in mathematics	70	2025	25 (Korea (25))
12	ICTP and Vietnamese Science: Celebrating 60 Years of Collaborations	120	2024	29 (US (02); Thailandd (01); Indonesia (02); Laos (3); Cambodia (2); France (3); Germany (2); Belgium (1); Italia (4); India (5); Japan (2); Korea (2))
13	Geometry and Dynamics in Low Dimensions	40	2025	23 (Canada (1), Thailand (1), China (5), Korea (1), Japan (5), US (9), Singapore (1))
14	Workshop on Modelling challenges in a changing climate and environment	50	2025	11 (Thaniland (01); Indonesia (02); Laos (3); Cambodia(2); France (3))

No.	School name	Attendees (In- person/Online)	Year Organized	Foreign participants
	Total	649/255		501
1	"International Graduate Summer School 2020", Date: 03 – 14/8/2020, Venue: Institute of Mathematics, VAST	30/30	2020	8 (Germany (02); France (02); Malaysia (02); Ý (01); Cambodia (01))
2	SEAMS school "Arithmetic, Geometry and Model Theory", Date: 17 – 28/02/2020, Venue: Institute of Mathematics, VAST	30/30	2020	12 (China (02); Thailand (01); Indonesia (02); Philippines: (02); UK (5))
3	Topology and Singularity Theory, Institute of Mathematics, December 2-4, 2021	20/20	2021	11 (Russia (01); US (02); Belgium (01); Greece (02); Hong Kong (01); Hungary (01); India (03))
4	Graduate School on Mathematics of Random Systems: Analysis, Modelling and Algorithms, Hanoi, 30 August-10 September, 2021	30/30	2021	11 (Thailand (02); Indonesia (03); Philippines: (02); France (02); Germany (01); US (01))
5	Internation school "International Graduate Summer School 2021", Hanoi, July 5-23, 2021	30/35	2021	8 (US (01); Belgium (01); Greece (01); Hong Kong; Hungary; India (03))
6	International school on Algebraic Geometry and Algebraic Groups and Workshop on	20/35	2021	26 (Malaysia

6. List of international schools

	Commutative Algebra and Algebraic Geometry, Hanoi, 1/11/2021-12/11/2021 and 15-16/11, 2021			(04); Italia (02); Cambodia (05); China (04); Thailand (02); Indonesia (04); Philippines (02); France (01); Germany (01); US (01))
7	Some Fundamental Methods in Qualitative Research and Optimization for Ordinary Differential Equations and Nonlinear Partial Differential Equations, Hanoi, December 1, 2021	20/10	2021	29 (Malaysia (05); Italia (05); Cambodia (05); China (04); Thailand (03); Indonesia (04); Philippines (03))
8	Summer School "International Graduate Summer School 2022", Hanoi, June 20-July 1, 2022	30/35	2022	23 (Malaysia (04); Italia (02); Cambodia (05); China (04); Thailand (02); Indonesia (04); Philippines (02))
9	COCOA 2023 International School on Computational Commutative Algebra, Hue, March 19-25, 2023	50	2023	16 (Thailand (03); Indonesia (05); Philippines: (05); UK (01); France (01); Germany (01))

10	Research school on "Machine Learning and Rough Path Theory for sequential data analysis", Hanoi, 20-24 February, 2023	30/30	2023	9 (Lebanon (01); Uzbekistan (02); Turkey (01); Slovenia (02); UK (01); France (01); Germany (01))
11	International Conference and Workshop "Selected topics in Arithmetic Algebraic Geometry"	60	2024	23 (Japan (04), Phillipines (04), Indonesia (02), India (02), Korea (02), France (06), Russia (1), Mexico (1), Singapore (1))
12	International Conference and Workshop: "Nonlocal Dynamical Systems"	30	2024	7 (Cambodia (2); Laos (2); Philippines (2); Germany (1))
13	Spring School and Workshop "Variational Analysis and Optimization 2025"	199	2025	63 (US (5), UK (5), Germany (15), France (10), China (8), Thailand (5), India (10), Spain (2), Korea (3))
14	"School and Workshop on Commutative Algebra and Algebraic Geometry in Prime Characteristics" 8 - 12/05/2023, Trieste https://indico.ictp.it/event/10200/ https://indico.ictp.it/event/10276/			

	"SCHOOL ON COMPUTATIONAL		
15	COMMUTATIVE ALGEBRA"		
	19 - 25/03/2023, Hue		
15	https://viasm.edu.vn/hdkh/COCOA-2023		
	https://cocoa.dhsphue.edu.vn/Modules		
	/Tintuc/front_detail_news.aspx?idmenu=1170		

No.	Event Name	Attendees (In- person/Online)	Year Organized
	Total	5.650 participants, 170.000 online, 1.700 students	
1	International Mathematics Day, March 14; 2 lectures, 5 panelists discussion "Mathematics for a Better World"	100 participants/ 20.000 online	2021
2	Quantitative Economics Competition for Students	300 participants	2021
3	Workshop on "Applied Mathematics in Agricultural Digital Transformation, Food, and Rural Development" with the participation of Agricultural Cooperatives and Thua Thien Hue Provincial People's Committee, co-organized with the Vice Chairman of Thua Thien Hue Provincial People's Committee, Directors of Institute of Water Resources Science, Institute of Agricultural Sciences, representatives of the Ministry of Agriculture and Rural Development, with 5 invited speakers and panel discussions	100 participants, 10.000 online	04/12/2021
4	International Mathematics Day, March 14; 2 lectures, panel discussion with 5 panelists. "Mathematics for Everyone	100 participants/ 5.000 online	2022
5	Quantitative Economics Competition for Students	300 students	2022
6	Hoang Tuy Mathematics Competition for High School Teachers	100 participants/ 5.000 online	2022
7	Science and Technology Day: "Mathematics in Various Fields and Social Issues"	200 participants, 10.000 online	2021
8	International Mathematics Day, March 14; 2 lectures "Connecting Mathematics"	100 participants, 50.000 online	2023
9	Quantitative Economics Competition for Students	500 students, 2.000 participants	2023
10	International Mathematics Day, March 14; 2 lectures, panel discussion with 5 panelists "Playing with math"	200 participants, 10.000 online	2024
11	Science and Technology Day: " Mathematics in Various Fields and Social Issues "	100 tham gia/ 5.000 lượt xem online	2024
12	Quantitative Economics Competition for Students	600 students, 2.500 participants	2024
13	International Mathematics Day, March 14: 2 lectures, panel discussion with 5 panelists "Playing with math"	150 participants / 10.000 online	2025

7. Public Outreach Events for Mathematics

No.	Event Name	Attendees in- person/Online view)	Year Organized
	Total	1.650 participants, 225.000 online, over 30 news	
1	Exhibition "Agent Orange Disaster - 60 Years in Retrospect" at the Military History Museum, Hanoi. Co-organized with the Chemical Corps - Ministry of National Defense and VinIF Fund. Presentation of mathematical models	500 participants, more than 20 news	2021
2	"Innovation for Future Building Day": 6 public lectures, panel discussions with former Minister of Science and Technology Nguyen Quan, Prof. Ngo Bao Chau, Prof. Vu Ha Van, and other scientists	100 participants/ 70.000 online, 10 news	2021
4	"Sustainable Development Science Day"	200 participants, 20.000 online	2022
5	Vietnam Science and Technology Day (May 18) - Environmental science and technology, in collaboration with the UNESCO Center for Physics: 4 public lectures and panel discussions by physicists, mathematicians, biologists, experts from the UNESCO Biosphere Center in Vietnam	100 participants, 10.000 online	2022
6	Collaboration with the French Embassy, French Institute, Institute of Research and Development (IRD) to organize the Sustainable City Program: a series of public lectures on Sustainable Cities, in November 2021	200 participants, 100.000 online	2021, 2022
7	Science and Technology Day: "Science from Different Perspectives"	100 tham gia, 5.000 lượt xem online	2023
8	Participation in the establishment of the Asian-Pacific Women in Mathematics Association (AOWM), 2023.	50 participants from 10 countries	2023
9	Presented a lecture at the gender equality workshop organized by the French Embassy to commemorate the 50th anniversary of Franco-Vietnamese relations. March 8, 2023	100 participants / 5.000 online	2023
10	Guest speaker at the roundtable discussion "International Women's Day - Dialogue between Inspiring Women," organized by the French Institute in Ho Chi Minh City. March 8, 2024	300 participants / 5.000 online	2024

8. List of events organized by the Centre

Appendix V: Publications with full or partial support from the Centre

Total publications: 106 (The highlight people are the Centre's staff)

- 1. An, P. T., Huyen, P. T. T., & Le, N. T. (2021). A modified Graham's convex hull algorithm for finding the connected orthogonal convex hull of a finite planar point set. Applied Mathematics and Computation, 397, 125889. (SCI-E, Q1).
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- Artur Babiarz, Le Viet Cuong, Adam Czornik, <u>Doàn Thái Son</u>, Necessary and sufficient conditions for assignability of dichotomy spectra of continuous timevarying linear systems, Automatica 125 (2021), 109466, (SCI-E, Scopus).
- Artur Babiarz, Le Viet Cuong, Adam Czornik, <u>Doàn Thái Sơn</u>, Necessary and sufficient conditions for assignability of dichotomy spectrum of one-sided discrete time-varying linear systems, IEEE-Transactions on Automatic Control, Volume 67 (2022), Issue 4, 2039-2043, (SCI-E, Scopus).
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- Pham T. Huong, <u>Vũ Ngọc Phát</u>, Suboptimal finite-time control of singular large scale discrete-time equations with delayed interconnections, European Journal of Control, Volume 67 (2022), 100701, (SCI-E)
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- <u>Nguyen, Tat Thang</u>, Uniform stable radius and Milnor number for non-degenerate isolated complete intersection singularities. Manuscripta Math. 168 (2022), no. 3-4, 571–589.

- Nguyễn Quốc Thắng, On Brauer-Manin obstructions and analogs of Cassels-Tate's exact sequence for connected reductive groups over global function fields}, Proc. Jap. Acad. V. 97 (2021), No. 9, 67-72.
- 16. Nguyễn Quốc Thắng, On the Tits indices of absolutely almost simple algebraic groups over local and global fields}, J. Pure and Appl. Algebra v. 226 (2022), Paper. no. 107031, Issue 9, 42pp.
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Appendix VI: Link videos of lectures and panel discussions

- 2021:

+ Public lecture about Abel award 2021-Assoc. Prof. Dr. Phan Thị Hà Dương: một số ct của László Lovász

https://www.youtube.com/watch?v=Ae-2gQ12-

4M&list=PLyu2FbjfJbDi-4wNW9x3EZD209PUAe4eN&index=3

+ Public lecture: Assoc. Prof. Dr. Phan Thị Hà Dương-The Platonic Solids & the Mysteries of Mathematics

https://www.youtube.com/watch?v=ls7yqjpZ_zs&list=PLyu2FbjfJb Di-4wNW9x3EZD209PUAe4eN&index=5

+ Public lecture: Assoc. Prof. Dr. Phan Thị Hà Dương - Is our world immense or tiny?

https://www.youtube.com/watch?v=GNiN6J01jJc

+ Vietnam Science and Technology Day: Assoc. Prof. Dr. Hoàng Hữu Hạnh- Linked Data for Open Data in Agriculture and Rural Development:

https://www.youtube.com/watch?v=1DMjTTKdg4s

+ Vietnam Science and Technology Day: Assoc. Prof. Dr. Hồ Đăng Phúc- Statistics: A Bridge Between Mathematics and Experimental Science

https://www.youtube.com/watch?v=OaH5pwDZcOU

+ Vietnam Science and Technology Day: TS. Võ Sỹ Nam-Vietnamese Genome Decoding in the Age of Data Science and Artificial Intelligence

https://www.youtube.com/watch?v=h1siyp6rlKY

+ Vietnam Science and Technology Day: Dr. Phạm Quang Thái-COVID-19 Vaccine Technology and Key Vaccination Guidelines https://www.youtube.com/watch?v=kJPWEQQz-yI

+ Vietnam Science and Technology Day: Assoc. Prof. Dr. Nguyễn Thế Toàn- Some Geometric Problems and Phylogenetic Trees in Viruses

https://www.youtube.com/watch?v=ZZptq1aTORQ

+ Panel discussion- International Mathematics Day

https://www.youtube.com/watch?v=LWJxwORwnWs

- 2022:

+ Panel discussion- International Mathematics Day-" Mathematics Connects Us":

https://www.youtube.com/watch?v=PXpVqB7cfe4

+ International Mathematics Day: VõSỹ Nam - Decoding Your

DNA: Graph Theory Can Help:

https://www.youtube.com/watch?v=V1tU41N6wRY

+ International Mathematics Day: Ngô Đức Thành - Mathematics in Climate and Climate Change Research at the Regional Scale: https://www.youtube.com/watch?v=hOZmHogQ2Uc

- 2023:

+ Public lecture "An intellectual growth hub for the Vietnamese community" of Mr. Nguyễn Cảnh Bình: https://www.youtube.com/watch?v=pN9oo31L-to
+ Public lecture "Perturbation Theory of Low-Rank Matrices" of Prof. Vũ Hà Văn: https://www.youtube.com/watch?v=BRe8w2rrvvo
+ Vietnam Science and Technology Day: Opening Ceremony – Public lectures – Panel discussion https://www.youtube.com/watch?v=MEzcBSC6jIk

- 2024: International Mathematics Day: Playing With Math: https://www.youtube.com/watch?v=bv0hGbn_CzU



Appendix VII: Photos of the Centre's activities

Signing ceremony of the agreement on the establishment of the Centre between the Ministry of Science and Technology of Vietnam and the Director General of UNESCO (2017)



Inauguration ceremony (11/2021)



Roundtable "Cooperation and development between UNESCO Natural Science Centres and Programs" (2024)



Reception and Discussion with Ms. Lidia Brito, Assistant Director-General for Science at UNESCO (9/2024)



Conference of UNESCO Science Centres in Malaysia (5/2024)



ICTP and Vietnamese Science: Celebrating 60 Years of Collaborations & Meeting with the Director of ICTP (11/2024)



Panel discussion at ICTP and Vietnamese Science: Celebrating 60 Years of Collaborations (11/2024)



VIET NAM YE

In November 2023, Assoc. Prof. Phan Thị Hà Dương attended and delivered a speech at the UNESCO General Conference in Paris

Assoc. Prof. Phan Thị Hà Dương reports to the Centre at Conference of UNESCO Science Centres in Malaysia (5/2024)



Governing board meeting, 2024



Governing Board Meeting (10/2023)



Prof. Dr. Ngô Việt Trung receives the Ta Quang Buu Award (2022)



Meeting and Working at the UNESCO Headquarters to Discuss the Renewal of the Centre (14-23/10/2024)



Prof. Dr. Phùng Hồ Hải, Former Director, Institute of Mathematics (2017-2021) in International Mathematics Day (2021)



Prof. Dr. Ngô Bảo Châu in Science and Technology Day (2021)



Mr. Nguyễn Quân, Former Minister of Science and Technology in Science and Technology Day (2021)



Organizing consultancy activities for policy makers, education experts and public propaganda about mathemacits (2022)



Assoc. Prof. Dr. Phan Thị Hà Dương reported at the 2024 Review Conference of the Ministry of Science and Technology



Ho Chi Minh Award ceremony



Board of Directors of 02 Centers participating in the Unesco General Conference, Paris, 11/2023



International Mathematics Day 2025: 'Mathematics, Art, and Creativity'



Assoc. Prof. Dr. Phan Thi Ha Duong, Director of ICRTM at International Mathematics Day 2025



Mrs. Nguyen Thi Van Nga, Director of Institute of Scientific Data and Information at International Mathematics Day 2025



Prof. Dr. Doan Thai Son, Director of Institute of Mathematics at International Mathematics Day 2025



Mr. Jonathan Baker, Head of Office and UNESCO Representative to Vietnam at International Mathematics Day 2025





Prof. Nguyen Hoang Hai at International Mathematics Day 2025

Prof. Dr. Tran Van Tan at International Mathematics Day 2025



International Mathematics Day 2025



Panel discussion at International Mathematics Day 2025

International Mathematics Day 2025

Science and Technology Day "Cooperation and development between UNESCO Natural Science Centres and Programs", 2024



Prof. Trần Hồng Thái, Deputy Minister of Science and Technology



Prof. Chu Hoàng Hà, Vice President of Vietnam Academy of Science and Technology



Mrs. Trần Lan Hương, UNESCO Hanoi Office



Mrs. Lê Thị Hồng Vân, General Secretary of the Vietnam National Committee for UNESCO



Prof. Phan Thị Hà Dương presents the ICRTM



Prof. Đinh Văn Trung presents the ICP

Vietnam Science and Technology Day 2025: Basic Sciences for Sustainable Development





Panel discussion "Basic Sciences for Sustainable Development"





The Section on Natural Sciences- UNESCO Vietnam held a meeting on cooperation at the Ministry of Science and Technology in 2024



Participated in the 220th session of the UNESCO Executive Board (10/2024)



PGS. Phan Thị Hà Dương was a guest speaker at the "Maths Day for development" organized by UNESCO and CNRS on March 13-14, 2019 at UNESCO, Paris



The exhibition "Agent Orange Catastrophe - 60 Years in Review" took place at the Military History Museum in

Hanoi during July and August 2021



Roundtable "International Women's Day - Dialogue among Inspiring Women" was organized by the French Institute on March 8, 2024



Display products Science and Technology Day 20/5



International Mathematics Day 14/3

Conferences and Schools





CIMPA-IMH-VAST research school on "Recent developments in stochastic dynamics and stochastic analysis"

International conference "Nevanlinna theory and Complex Geometry in Honor of Lê Văn Thiêm's Centenary"



International Conferences and Schools 2022



International Conferences and Schools 2022



Public lecture on Sustainable Development (2023)



School on computational commutative algebra", 19 - 25/03/2023, Hue, Vietnam



School and Workshop on Commutative Algebra and Algebraic Geometry in Prime Characteristics", 8 - 12/05/2023, Trieste, Italia

Appendix VIII: Meeting minutes