



**МОНГОЛЫН МАТЕМАТИКИЙН  
НИЙГЭМЛЭГ ТББ**

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International Mathematical Union  
Secretariat  
Hausvogteiplatz 11A  
10117 Berlin, Germany

November 28, 2022


**Full Membership Request**

Dear Professor Helge Holden,

On behalf of the Mongolian Mathematical Society, I hereby submit the application of Mongolia to become a Full Member (Group I) of the International Mathematical Union. Mongolia became an Associate Member of the IMU in 2021, and attended the 19<sup>th</sup> GA of the IMU in Helsinki from 3-4 July 2022.

Please find the attached pdf file updating the state of mathematics in Mongolia.

Sincerely yours,

Prof. L. Altangerel   
President of Mongolian Mathematical Society  
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## **Application of Mongolia to become the full membership of the IMU**

### **Submitted by the Mongolian Mathematical Society**

Mongolia is a landlocked country in East Asia with a population of 3.3 million.<sup>1</sup> In 2021, Mongolia celebrated 100<sup>th</sup> anniversary of the establishment for modern education system in Mongolia.

There are the following state universities playing significant roles in the development of mathematics education and research.

#### **National University of Mongolia (NUM)**

NUM is the first Mongolian university established in 1942.<sup>2</sup> Currently, there are two departments: mathematics and applied mathematics, which are responsible to offer mathematics courses to students in different study programs at various levels including bachelor's, master's and doctor's degree in mathematics, applied mathematics, mathematics teacher and statistics and other programs. One of the oldest departments of NUM is the Department of Mathematics which had different structure with specialized areas of mathematical analysis, algebra, geometry, probability theory and didactics of mathematics included in faculties such as Pedagogic Faculty (1942-1957), Faculty of Natural Sciences (1957-1962), Faculty of Mathematics and Physics (1962-1991), Faculty of Mathematics (1991-1997), School of Mathematics and Computer Science (1997-2013), and School of Arts and Sciences (since 2013), and currently has 19 professors and lecturers.

Department of Applied Mathematics was established in 1962 and with specialized areas of numerical mathematics, modeling, optimal control, optimization, differential equations, visualization, simulation and applications included in different faculties such as Pedagogic Faculty (1942-1957), Faculty of Natural Sciences (1957-1962), Faculty of Mathematics and Physics (1962-1991), Faculty of Mathematics (1991-1997), School of Mathematics and Computer Science, School of Business and Economics, School of Geology and Geography (1997-2013), and School of Engineering and Applied Sciences (since 2013), and currently has 29 professors and lecturers.

The first Mongolian scientists in Mathematics were educated in the Soviet Union universities and the first mathematician who obtained Ph.D degree in mathematics was Prof. L.Shagdar from the Lomonosov Moscow State University in 1954.

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<sup>1</sup> <https://en.wikipedia.org/wiki/Mongolia>

<sup>2</sup> [https://en.wikipedia.org/wiki/National\\_University\\_of\\_Mongolia](https://en.wikipedia.org/wiki/National_University_of_Mongolia)

Starting from the beginning 2000s, young generation of Mongolian mathematicians started to obtain Ph.D degrees from the universities in developed countries such as Japan, USA, Germany and Korea and now they are working in different fields of mathematics including algebra, analysis, functional analysis, geometry, topology, algebraic geometry, partial differential equations, probability and statistics, numerical mathematics, optimization, operations research and didactics of mathematics.

### **Mongolian University of Science and Technology (MUST)**

MUST was founded in 1969 as a part of the National University of Mongolia with 5 faculties and 13 departments and named before as the Polytechnical Institute and Technical University . The Mongolian University of Science and Technology, one of the leading state universities in the country.<sup>3</sup>

The department of Mathematics at MUST was part of different faculties such as General Academic Faculty of Polytechnic Institute, Fundamental Education Center of Technical University, Engineering Fundamental Education Center of Technical University, School of Applied Sciences (currently), consisting of 45 members including professors and lecturers and is responsible to offer mathematics courses to students in all engineering study programs.

Research fields: Theoretical and Numerical Research of PDE, Mathematical Modeling of Economics and Ecology, Theory of Fuzzy Sets, Banach Algebra, Discrete, Dynamic, Stochastic modeling and simulation, Optimization, Functional Analysis, Theory of Operator.

### **Mongolian National University of Education (MNUE)**

Mongolian State University of Education was established in 1951 as a platform to prepare secondary education teachers. Currently the university has 12 branch education studies schools.<sup>4</sup>

The department of mathematics at MNUE consists of 19 members including professors and lecturers and is responsible to offer mathematics courses to students in study programs in mathematics and other study programs.

### **Mongolian University of Life Sciences (MULS)**

MULS is formerly the veterinary faculty of the National University of Mongolia named also as Institute of Agriculture, currently it consists of seven schools, four research institutes and three university branches in provinces.<sup>5</sup>

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<sup>3</sup> [https://en.wikipedia.org/wiki/Mongolian\\_University\\_of\\_Science\\_and\\_Technology](https://en.wikipedia.org/wiki/Mongolian_University_of_Science_and_Technology)

<sup>4</sup> [https://en.wikipedia.org/wiki/Mongolian\\_State\\_University\\_of\\_Education](https://en.wikipedia.org/wiki/Mongolian_State_University_of_Education)

<sup>5</sup> [https://en.wikipedia.org/wiki/Mongolian\\_University\\_of\\_Life\\_Sciences](https://en.wikipedia.org/wiki/Mongolian_University_of_Life_Sciences)

The department of Economics and Mathematical modeling is responsible to offer modules of mathematics to students in study programs in mathematical modeling in economics and other study programs.

### **Institute of Mathematics and Digital Technology (IMDT)**

IMDT (formerly Institute of Mathematics) was established in 1974 and was part of NUM between 1997-2015. Currently, IMDT consists of three sectors: mathematics, information technology and simulation and is one of the institutes of the Mongolian Academy of Sciences.

### **The Mongolian Mathematical Society (MMS)**

MMS was founded in 1995 to advance, disseminate and promote mathematical knowledge to society, to enhance the status of the profession of mathematics and, currently is managed by the Board consisting of 9 members representing universities and institutes: NUM, MUST, MNUE, IMDT, German-Mongolian Institute for Resources and Technology (GMIT) and University of Economics and Finance (UEF) elected since November 2018.

Additionally, there are more than 15 universities and institutes in which are offered mathematics modules including GMIT, UEF, Ulaanbaatar State University (USU), and Mongolian University of Health Sciences (MUHS).

## **An overview of the state of mathematical activities in Mongolia:**

1. Number of universities where mathematics is taught – 19
2. List of universities and institutes with significant research activities in mathematics:
  - a) National University of Mongolia (NUM)
  - b) Mongolian University of Science and Technology (MUST)
  - c) Mongolian National University of Education (MNUE)
  - d) Institute of Mathematics and Digital Technology at Mongolian Academy of Sciences (IMDT)
3. Estimated number of professors in mathematics in Mongolia – 75
4. Estimated number of research mathematicians in Mongolia – 90
5. List of Mathematical Societies in Mongolia
  - Mongolian Mathematical Society (100 members)
6. Well-know mathematicians in Mongolia
  - a) Prof. L.Shagdar (1925-2016) – National University of Mongolia (Ph.D from the Lomonosow Moscow State University, Russia)
  - b) Academician, Prof. A.Mekei (1940-2013)– National University of Mongolia, former Director of Institute of Mathematics, former President of Mongolian Mathematical Society (Ph.D and Sc.D from the Lomonosow Moscow State University, Russia)
  - c) Academician, Prof. T.Zhanlav - National University of Mongolia, Institute of Mathematics and Digital Technology, former dean of the School of Mathematics and Computer Science at NUM (Ph.D from Novosibirsk State University and Sc.D from the Joint Institute for Nuclear Research in Dubna, Russia)
  - d) Prof. Ts. Dashdorj – National University of Mongolia, former President and one founder of the Mongolian Mathematical Society (Ph.D. from the Institute of Mathematics of Moldavian Academy of Sciences)
  - e) Prof. R.Enkhbat - National University of Mongolia, Institute of Mathematics and Digital Technology, former Director of the Institute of Mathematics (Ph.D from Irkutsk State University and Sc.D from the Mongolian Academy of Sciences)
  - f) Prof. A.Galtbayar – National University of Mongolia, former President of National University of Mongolia (Ph.D. from Tokyo University, Japan)
  - g) Academician O.Chuluunbaatar - Joint Institute for Nuclear Research in Dubna, Institute of Mathematics and Digital Technology (Ph.D. and Sc.D. from the Joint Institute for Nuclear Research in Dubna, Russia)
  - h) Dr. U.Otgonbayar – National University of Mongolia, former Director of the Institute of Mathematics and President of Mongolian Mathematical Society (Ph.D. from Penn State University, USA)

i) Dr. Ch. Altannar – National University of Mongolia (Ph.D from the University of Florida, USA)

8. Estimated number of mathematical publications produced by mathematicians in Mongolia – 215 (since 2005)

9. List of Mathematical journal published in Mongolia

- a) Mongolian Mathematical Journal (former Journal of Mongolian Mathematical Society, since 1997, in English, indexed in MathSciNet)
- b) Journal of Applied Sciences and Engineering A (since 2019, in English)

10. A brief overview of educational activities in Mongolia

The first graduates in study program of mathematics and physics teacher graduated from the NUM in 1946 and since then each year have graduations in different study programs including mathematics, applied mathematics, applied statistics, mathematics and informatics teacher, mathematical modeling in economics, engineer mathematics from NUM, MUST, MNUE, and other state and private universities and institutes.

Although the Mongolian Mathematical Olympiad started in 1965, the first participation of Mongolia in International Mathematical Olympiad was in 1964. Up today, the Mongolian team awarded 6 gold, 30 silver and 74 bronze medals and was ranked 29<sup>th</sup> place in 2022.

Adhering Committee

Due to the Statute of IMU, the Mongolian Adhering Committee is:

The Mongolian Mathematical Society

P.O.Box 46/975, 210646, Ulaanbaatar, Mongolia

President: Prof. L.Altangerel ([altangerel@gmit.edu.mn](mailto:altangerel@gmit.edu.mn))

Managing Director: Prof. Ch.Naranchimeg ([naranchimeg.ch@ufe.edu.mn](mailto:naranchimeg.ch@ufe.edu.mn))

E-mail: [mathsociety.mn@gmail.com](mailto:mathsociety.mn@gmail.com), [mms@mathsoc.mn](mailto:mms@mathsoc.mn)

## **Appendix: International conferences and workshops organized in Mongolia (since 2010)**

1. The International Conference on Optimization, Simulation and Control in Ulaanbaatar, Mongolia, July 25 -- 28, 2010 (NUM)
2. V International Symposium "Generalized Statements and Solutions of Control Problems" in Ulaanbaatar, Mongolia, September 13 - 17, 2010 (MUST)
3. Russian-Mongolian Conference on Mathematical Modeling, Information Technology and Control of Young Scientists in Khanh, Mongolia, June 17 - 21, 2011(National Development Institute of Mongolia)
4. The 4th International Conference on Optimization, Simulation and Control in Ulaanbaatar, Mongolia, July 1 -- 4, 2013 (NUM)
5. Partial Differential Equations in Mechanics, CIMPA research school in Ulaanbaatar, July 15-28, 2013 (MUST)
6. Hypergeometric Functions and Representation Theory, CIMPA research school in Ulaanbaatar, August 5-16, 2013 (NUM)
7. Stochastic Processes and Applications, CIMPA research school in Ulaanbaatar, July 27 – August 7, 2015 (NUM)
8. ICOTA-10, Ulaanbaatar, July 23-26, 2016 (NUM, MUH, GMIT)
9. Differential Equations and Functional Analysis, CIMPA research school in Khovd, July 16 – 28, 2017 (MUST, Khovd University)
10. FICASE -2019, April 4-6, 2019 (MUST)
11. The 6th International Conference on Optimization, Simulation and Control, Ulaanbaatar June 21-23, 2019 (NUM, MUH, GMIT)
12. Data Assimilation, Optimization and Applications, CIMPA research school in Ulaanbaatar, July 5-10, 2021 (expected to organize at GMIT in hybrid form )
13. The 7th International Conference on Optimization, Simulation and Control, Ulaanbaatar June 20-22, 2022 (MAS,NUM, MUH, GMIT)