CIMAT

Centro de Investigación en Matemáticas, A.C.

Mathematics Research Center

www.cimat.mx

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Mathematics Research Center - CIMAT

CIMAT is a leading Mexican research center, belonging to the National Council for Science and Technology (CONACYT) system of public research centers. CIMAT was established in 1980 in the city of Guanajuato by a small group of researchers from the National Autonomous University of Mexico (UNAM) who dreamed of a math center outside Mexico City. The institution grew up over the years and nowadays is dedicated to the production, dissemination and application of advanced knowledge within three major fields: pure and applied mathematics; probability and statistics and computer science.

The main goals of CIMAT are to generate scientific knowledge through research in its areas of expertise; provide undergraduate and graduate programs in the same areas and to strengthen its relationships with the public, private and social sectors through applied research projects, technology transference, consulting services, educational and training programs, and the dissemination of mathematical knowledge.

CIMAT also provides support for solving problems that require cutting-edge mathematics in industry and public sectors. These core tasks aim to promote the scientific development and technological development of the community.

Research

Due to its unique orientation, research activities at CIMAT encompass a broad range of areas. Research staff is composed of top researchers, most of them being members of the National System of Researchers. CIMAT's mathematicians (more than 114 in 2018) collaborate with coleagues in Mexican and foreign research institutes, fostering the advancement and dissemination of knowledge through lecture series and co-authored papers. Research activities at CIMAT are supported by permanent seminars, short and long-term visits, postdoctoral research and outreach activities involving postgraduate students.

There are three major research fields at the CIMAT:

Pure Mathematics

This group is one of the most important in Latin-America and the largest Mexican research group outside the Contry's capital city. Its world-class researchers cover a wide range of topics, both in pure and applied mathematics.

Research topics:

- Algebra
- Functional Analysis
- Mathematical Economics
- Mathematical Physics
- Complex and Algebraic Geometry
- Differential Geometry
- Lie groups, Lie Algebras and G-structures
- Multidisciplinary Mathematics and Mathematical Modeling
- Dynamical systems
- Topology
- Partial Differential Equations

Probability and statistics

Its research activities cover a wide spetctre of topics in pure and applied statistics. CIMAT statisticians participate in graduate and undergraduate programs and often create multidisciplinary groups to provide solutions for the academic, social and productive sectors.

Research topics:

- Probability Theory
- Statistics Theory
- Statistical Inference in Data Science
- Topological Data Analysis
- Finance and Risk
- Stochastic Modeling and Inference

Computer Science

The computer scientists at the CIMAT produce cutting-edge research in many important areas of computing and information technologies but also have the tools to solve complex problems in computing for industry, medicine, economics, public service, science and other fields.

Computer Science area at CIMAT manages and operates a supercomputing cluster, "El Insurgente", offering high performance computing services to academic institutions, private companies and government agencies.

Research topics:

- Numerical Methods, Optimization and Parallel Computing
- Robotics
- Machine Learning and Multidimensional Data Analysis
- Computer Vision and Signal Processing

Academics

CIMAT offers undergraduate specialty master and doctoral degrees through competitive programs. mathematics and computer science bachelor degrees are offered in conjunction with the mathematics department of the state University of Guanajuato.

Master and doctoral degree is belong to the national register of postgraduate quality program. In all of our programs, students work with researchers that active in the international community of mathematicians, therefore providing a high-performance environment. CIMAT also offers a training program for professionals interested in statistical tools. The Statistical Methods Specialty program is taught in the city of Aguascalientes, where CIMAT has one of its secondary heaquarters.

Master degree programs:
- Pure mathematics
- Applied mathematics
- Statistics and probability
- Computer science
- Software engineering
- Statistical computing
- Process Modelling and Optimization

Graduate skills
Mathematics: graduates will have a deep knowledge of pure and applied mathematics and will be able to apply this skill in creative frontiers science with analytical thinking. Skills and techniques gained on the mathematical degree can be useful numerous jobs particularly in research and development environments

Statistics and probability: major companies around the world employ statisticians and their work is relevant for the civil service, health service, research facilities, banking and financial services, where their skills and knowledge provide the necessary conditions to quantify uncertainty and support decision taking systems.

Computer science: graduates have a solid background in Core areas and exposure to cutting edge research in many fields of computer science and IT. Computer scientists also have the tools needed to solve complex problems in interdisciplinary environments, from oil extraction to automation or clinical research.

Statistical Computing
graduates will be capable to lead the desing and execution of complex and high-volume data projects, apply scientific computing methods to the study of specific phenomena, using statistical knowledge to analyze data and obtain the necessary results.

Process modelling and optimization: this program graduates are able to propose models to increase the benefit of technological innovation and the value adding of processes. They are also capable to conduct research and development teams and their use of mathematical and computing models.

Admission process for foreign students
Foreing students are able to take remote examinations and have their interviews online. Afterwards, accepted candidates receive orientation from CIMAT's staff regarding immigration processes. Scholarships for foreing students are granted by the Organization of American States (OAS) or the Foreign Affairs Ministry of Mexico (SRE).

Expanding horizons

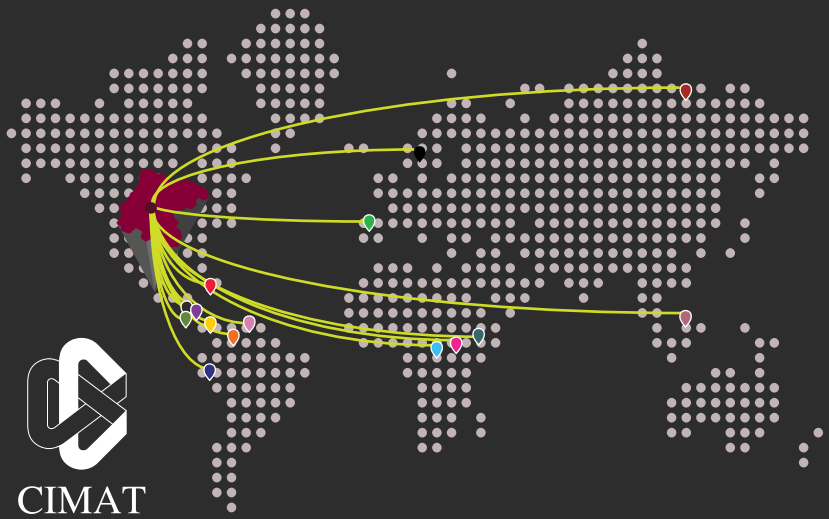
Where do our graduates go to pursue further studies and make postdoctoral stays?

- Arizona State University
- Colegio de Postgraduados
- CINVESTAV-IPN
- Ohio State University
- Heidelberg University
- Deutsches Zentrum für Luft und Raumfahrt (DLR)
- National Institute for Pure and Applied Mathematics (IMPA)
- New York University
- Texas A&M University
- University of Houston
- Complutense University of Madrid
- University of Valencia (UV)
- Polytechnical University of Madrid (UPM)
- Tilburg University
- Tohoku University
- Walter + Eliza Hall Institute of Medical Research
- University of Alberta

Where do our students come from?

Our educational programs are internationally recognized so the number of foreign students at CIMAT represent between 15 to **20% of our enrollment.**

Bolivia
Cambodia
Colombia
Costa Rica
Congo
Cuba
El Salvador
Guatemala
Venezuela
Germany
Honduras
Kenya
Spain
Nicaragua
Peru
Russia
Rwanda



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Academic events

The CIMAT continuously organizes conferences, workshops and seminar series to support research activities and promote the collaboration with top internationally-known mathematicians. The continuity and high quality of these events foster the dissemination of knowledge and produce collective discussions for scientific feedback.

Due to these activities, students at the CIMAT are constantly interacting with experts to reinforce learning and delimit their research interests. The expertise accrued over the years, has allowed the CIMAT to organize major congresses like the Fifth World Congress of the Institute of Mathematical Statistics and the Bernoulli Society held in 2000 with more than 500 attendants or the First Mathematical Congress of the Americas (MCA2013) that attracted more than one thousand mathematicians. CIMAT also hosted the Fifth Pacific-Rim Symposium on Image and Video Technology (PSIVT2013) and the Conference of the International Society for Bayesian Analysis (ISBA2014). On 2019, CIMAT will host the 15th edition of the Latin American Congress on Probability and Mathematical Statistics, the region's largest meeting on this scientific fields.

Technological Services

Mathematics and the application of mathematical methodologies are fundamental tools of innovation, providing solutions for the public, private and social sectors that can help raise the living conditions for society, and even contribute towards creating a safer and better world. In the private sector, with mathematics at the heart of methodologies and processes in all business areas, companies that take advantage of can gain a significant competitive advantage.

The Office of Technological Services is the dedicated unit of CIMAT in charge of promoting the transference of mathematical knowledge towards public and private organizations, and organizing the collaboration between CIMAT's multidisciplinary teams of researchers, members of our technological staff and graduate students.

Fields Of Expertise

- Complex data numerical analysis and mathematical modeling.
- Computer vision, signal and image processing
- Multimensional data analysis and decision supported systems
- Robotics and Artificial Intelligence

Training courses are also provided on a scheduled basis or designed by request from public and private organizations.

Facilities

CIMAT's headquarters are located in the central city of Guanajuato (226 miles from Mexico city) where spacious facilities house the activities of researchers, students and administrative staff. Facilities include:

- Supercomputing cluster
- Software development and electronics laboratories
- Auditorium
- Seminar classrooms
- Multi-purpose rooms
- Library (20,000+ volumes)
- Work and meeting rooms for researchers and graduate students

Secondary headquarters:

- Aguascalientes, AGS.
- Mérida, YUC.
- Monterrey, NL.
- Zacatecas, ZAC

Contact us

Address: Jalisco s/n Valenciana, CP 36240, Guanajuato, Mexico
Phone number: +52(473) 732 7155
Facebook: www.facebook.com/CIMATMexico
webpage: www.cimat.mx
twitter: @cimatoficial

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