RESEARCH AREAS

Mathematical Analysis

Mathematical Analysis is the part of mathematics that originated with calculus and has strong connections with geometry. Modern analysis developed from the theory of integration and differentiation and took off with Banach's work on linear operations after the groundwork has been laid with topology, algebra and Lebesgue's theory of integration and integral equations. Von Neumann's work on operator theory, motivated by quantum mechanics, gave a strong impetus. Mathematical Analysis has applications to many other areas of mathematics, science and technology and on the other hand, several problems from these areas have led to important developments in analysis. The research in analysis in the Mathematics Department centers around two main subareas.

Gong, Li and Pasnicu work on C^*-algebras and noncommutative geometry. A commutative C^*-algebra corresponds to a locally compact Hausdorff space. But many geometrical objects such as foliations, dynamical systems, give rise to noncommutative C^*-algebras. The researches have been successful in obtaining results concerning classification and structure for many important classes of C^*-algebras as well as interesting results in some geometry problems by using C^*-algebras. Their publications have appeared on Journals such as Annals of Math, Invent. Math., Duke Math. Journal, J. Reine Angew. Math. (Crelle's Journal), Mem. Amer. Math. Soc., American J. Math., GAFA and J. Funct. Analysis.

The research of Keyantuo and Warma centers around functional analytic methods for partial differential equations. Semigroups of operators and their generalizations combined with tools from vector-valued harmonic analysis and potential theory are used to study well-posedness and maximal regularity for of initial and boundary-value problems. The theory of differential equations is at the origin of much of modern analysis and has connections with differential geometry, dynamical systems and mathematical physics. Results have been published in such journals as the Journal of Differential Equations, Potential Analysis and Mathematische Annalen.

Faculty in this area

1. Guihua Gong
2. Valentin Keyantuo
3. Liangqing Li
4. Cornel Pasnicu
5. Silviu Teleman
6. Mahamadi Warma

Graduate Students

Analysis Seminar

Discrete Mathematics

Faculty in this area *Graduate Students*

1. Francis Castro
2. Italo Dejter
3. Reza Emamy
4. Raúl Figueroa
5. Puhua Guan
6. Alexander Kelmans

Discrete Mathematics Seminar

Other faculty with interest related to this area

1. Heeralal Janwa
2. Pablo Salzberg

Computational Mathematics and Statistics

L.R. Pericchi G. and M.E. Pérez research is on Bayesian and Computational Statistics and Decision Theory. Their methodological research focuses on Model Selection and Hypothesis Testing. They also are involved, both jointly and independently, in applied and multidisciplinary projects, in areas such as: risk assessment and flood prediction, robust analysis and design of clinical trials and medical statistics, application to social sciences and econometrics, Bayesian methods for population genetics, population viability analysis and conservation of endangered species. Results obtained have been published in journals in Statistics as well in other scientific areas, including: Annals of Statistics, Journal of the Royal Statistical Association series B and C (Applied Statistics), Journal of Statistical Planning and Inference, Lecture Notes of the Institute of Mathematical Statistics, Journal of Hydrology, Stochastic Environmental Research Risk Assessment, Journal of Animal and Feed Sciences, Pediatric Infectious Diseases Journal, American Journal of Tropical Medicine and Hygiene, Vaccine, Diagnostic Microbiology and Infectious Disease

Faculty in this area *Graduate Students*

1. Heeralal Janwa
2. María Eglée Pérez
3. Luis Raúl Pericchi
4. Pablo Salzberg

Computational Mathematics and Statistics Seminar

Other faculty with interest related to this area

1. Francis Castro
2. Mariano Marcano