

Argentina

Facultad de Matemática, Astronomía y Física (FAMAF)

Address: Ciudad Universitaria, 5000 Córdoba, Argentina. **Phone:** (+54 51) 334051; **Fax:** (+54 51) 334054. **E-mail:** postmaster@famaf.unc.edu.ar.

Director/Head: Christian U. Sanchez.

Number of Research Scientists: 95; **Number of Staff:** 60.

Scientific Fields of Interest: Materials; Mathematics; Physics; Astronomy; Computation; Education.

Main Lines of Research and Training Activities: Differential geometry; representations of Lie groups and algebras; harmonic analysis on \mathbb{R}^n ; nonlinear partial differential equations; numerical analysis; probability and statistics; material sciences; nuclear and atomic spectroscopy; atmospheric physics; general relativity and gravitation; nuclear magnetic resonance; condensed matter; teaching of physics and mathematics; microelectronics.

Major Scientific Results or Products: Papers in Mathematics: *Transaction of the AMS. manuscripta mathematica*; *Proc. AMS; Pacific*; *Journal of Functional Analysis*; *Illinois Journal of Math. Math. Annalen*; *Geometrica Dedicata*; *London Math. Journal*; *Journal of Algebra*. Papers in Physics: *Journal of Geophysical Research*; *Scripta Metalurgica*; *Mat. Sci. and Eng.*; *X-ray Spectrometry*; *Electron Microscopy*; *Revista Brasileira de Engenharia*; *Tribuna Biologica e Medica*; *Physics A*; *Am. J. Phys*; *Letters in Mathematical Physics*; *Gen. Rel. Grav*; *Physics Letters*; *Physical Review*; *Class. Quantum Grav*; *International J. of Theor. Physics*; *J. Phys. C, Solid State*; *J. Mag. Res*; *J. Phys, Condensed Matter*; *Liq. Crystals*; *Bulletin of Magnetic Resonance*; *Z. Naturforsch*; *Proc. of several symposia in Europe, Brazil and USA.*

Main Research Facilities Available: Library with 4,000 books in mathematics and physics; 150 journals purchased annually; various Sun Sparc stations; 2 Next; resonance magnetic spectrometer; X-ray spectrometer.

Future Development Plans: To continue and reinforce PhD and research programmes, to obtain fellowships for foreign students, to enhance laboratories; to strengthen relationship with productive and educational sectors.

Cooperation Arrangements with Developing Countries: Arrangements with developing countries are carried out through National Council of Scientific and Technical Research (CONICET) of Argentina. Expansion of arrangements underway.

Other International Cooperation Arrangements: Several grants from the Abdus Salam International Centre for Theoretical Physics (ICTP), the Third World Academy of Sciences (TWAS), National Science Foundation (NSF).

Instituto Argentino de Matemática (IAM-CONICET)

Address: Viamonte 1636, 1055 Buenos Aires, Argentina. **Phone:** (+54 1) 371 5082; **Fax:** (+54 1) 372 5976; **E-mail:** postmaster@iamba.edu.ar.

Director/Head: Gustavo Corach.

Number of Research Scientists: 18; **Number of Staff:** 5.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Weights in homogeneous spaces; operator theory; operator algebras; infinite dimensional differential geometry; distribution products; bounded holomorphic functions; stable rank theories; partial differential equations.

Main Research Facilities Available: Complete mathematical library; some computer facilities.

Future Development Plans: Current research supervised by senior researchers will continue to be pursued in future; hope to enlarge number of research scientists.

International Cooperation Arrangements: Some scientists have joint projects with mathematicians working at Universidad de la República, Uruguay; Universidad Simón Bolívar, Venezuela; Universidad de San Marcos, Peru; University of Illinois at Urbana, Universidad Complutense, Madrid, Spain; Universidad de Zaragoza, Spain; Université Libre de Bruxelles, Belgium; University of Pittsburgh, USA.

Universidad de Buenos Aires Facultad de Ciencias Exactas y Naturales Departamento de Matemática

Address: Ciudad Universitaria, Pab. I, 1428 Buenos Aires, Argentina. **Phone:** (+54 1) 782 0319; **Telex:** (+54 1) 782 0620; **E-mail:** depto@dm.uba.ar.

Director/Head: Alicia Dickenstein.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Algebra of the logic; analytic geometry and algebraic geometry; biomathematics; categories; complexity and computational algebraic geometry; convexity; cyclic homology; quantum groups; homology of non-commutative algebras; didactics of mathematics; differential equations and numerical analysis; distribution theory; functional analysis; spaces of analytic functions; operator theory; harmonic analysis; mathematical models in image processing; multifractal spectra in quantum mechanics and hyperbolic geometry; nonlinear differential equations; robust statistical methods and non-parametric estimations; signals and control systems; stochastic and Riemannian geometry.

Main Research Facilities Available: PC computers with full Internet facilities, mathematical word processors and main symbolic and numerical packages, quite incomplete library.

Future Development Plans: Current fields of research will be pursued and enlarged.

Brazil

Institute of Pure and Applied Mathematics (IMPA)

Address: Estrada Dona Castorina, 110, Jardim Botânico, 22460-320 Rio de Janeiro, RJ, Brazil. **Phone:** (+55 21) 529 5270, 529 5000; **Fax:** (+55 21) 512 4115; **E-mail:** diretor@impa.br.

Director/Head: Jacob Palis.

Number of Research Scientists: 35; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Training activities: PhD and Master's Programme in the areas listed below: Algebra; Partial Diff. Equations, (P.D.E.) and Numerical Analysis; Differential Geometry; Probability; Dynamical Systems; Graphic Computation; Mathematical Economy; Statistics; Operations Research.

Major Scientific Results or Products: IMPA has produced more than 500 research papers published in major international mathematical journals in past decade; PhD programme main one in Latin America (more than 110 PhD theses completed in past 20 years); influenced in fundamental way development of mathematics throughout region.

Main Research Facilities Available: Library: 28,000 books and 28,000 volumes of journals, including 550 subscriptions to periodicals (half are complete collections); Computers: well-equipped labs available for researchers and students.

Future Development Plans: Improve theoretical areas such as algebra and algebraic geometry, partial diff. equations, diff. geometry, probability and dynamical systems by hiring outstanding young researchers; pursue major developments both in personnel and laboratory equipment in computer sciences, especially computer graphics; numerical analysis related to diff. equations, especially problems concerning oil engineering, mathematical economics, statistics and operations research.

Cooperation Arrangements with Developing Countries: Extensive cooperation with all major countries in Latin America; large number of PhD students come from these countries (Uruguay, Argentina, Venezuela, Chile, Mexico, Peru).

Other International Cooperation Arrangements: With main countries in Northern hemisphere through joint research projects (USA, Canada, Russia, France, Belgium, Japan, England, Switzerland, Sweden).

Pontifcia Universidade Catlica do Rio de Janeiro (PUC/Rio) Department of Computer Science

Address: Rua Marquês de São Vicente, 225, 22453-900 Rio de Janeiro, RJ, Brazil. **Phone:** (+55 21) 274-4449; **Telex:** (+55 21) 31048; **Fax:** (+55 21) 511-5645; **E-mail:** arndt@inf.puc-rio.br.

Director/Head: Arndt von Staa.

Number of Research Scientists: 26; **Number of Staff:** 11.

Scientific Fields of Interest: Computer Science.

Main Lines of Research and Training Activities: Databases; Computer graphics; Software engineering; Artificial intelligence; Mathematics of computation; Design and analysis of combinatorial algorithms; Computer network and distributed systems; Theory of computation.

Major Scientific Results or Products: In 1994, produced 3 doctorate theses; 26 master dissertations; 17 papers in international journals; 38 papers in conference proceedings; In 1995, produced 13 doctorate theses; 21 master dissertations; 18 papers in international journals; 56 papers in conference proceedings. In 1996, produced 6 doctorate theses; 26 master dissertations; 18 papers in international journals; 55 papers in conference proceedings.

Main Research Facilities Available: 220 workstations (Sun's, PC's, Mac's, DEC's); library with 7000 book titles and 123 subscriptions to periodicals.

Cooperation Arrangements with Developing Countries: Informal arrangements with Argentina and Chile.

Other International Cooperation Arrangements: Scientific exchanges with France (University of Grenoble, cooperation programme CAPES/COFECUB; University of Paris VI (CNPq/CNRS); Canada (Polytechnic School of Montreal and University of Waterloo, CNPq/NSERC); and with Germany, CNPq/GMD.

Pontifcia Universidade Catlica do Rio de Janeiro (PUC/Rio) Departamento de Matematica

Address: Rua Marquês de São Vicente, 225, Rio de Janeiro, RJ 22453-900, Brazil. **Phone:** (+55 21) 2595495; **Fax:** (+55 21) 2595495; **E-mail:** depto@mat.puc-rio.br.

Director/Head: Paul A. Schweitzer.

Number of Research Scientists: 26; **Number of Staff:** 9.

Scientific Fields of Interest: Pure and Applied Mathematics.

Main Lines of Research and Training Activities: Geometry and topology (differential and algebraic topology, foliations, differential and conformal geometry of surfaces, symplectic and riemannian geometry); analysis, differential equations and dynamical systems; algebraic geometry; scientific computation; fluid dynamics; mathematical economics; quantum mechanics; combinatorics; mathematical education and use of multimedia tools; geometric modelling and visualization.

Major Scientific Results or Products: In 1996, produced 20 published papers, 22 preprints, and one book as well as software for geometric modelling; hosted two national and one international meeting.

Main Research Facilities Available: 10 Workstations (including SPARC-20 and Silicon Graphics Indigo II) and 20 microcomputers in 5 laboratories; small library; easy access to IMPA's excellent library.

Future Development Plans: Standing policy of hiring promising young research post-doctorates in areas of interest.

International Cooperation Arrangements: Extensive interchange with several mathematics departments in France, USA, Germany, Mexico and other countries.

Universidade Estadual de Campinas (UNICAMP) Institute of Mathematics, Statistics and Scientific Computing (IMECC)

Address: Cidade Universitaria "Zeferino Vaz", Caixa Postal 6065, 13081, Campinas, SP, Brazil. **Phone:** (+55 192) 391113; **Fax:** (+55 192) 395808; **E-mail:** walrod@ime.unicamp.br.

Director/Head: W.A. Rodrigues Jr.

Number of Research Scientists: 141; **Number of Staff:** 65.

Scientific Fields of Interest: Energy; Engineering/Technology; Geological/Earth Sciences; Environment; Mathematics; Physics/Astronomy; Computer Science.

Main Lines of Research and Training Activities: Algebra, approximation theory; biomathematics, computational methods for optimization; computer science, differential equations and dynamical systems; geometry; harmonic analysis; holomorphy; inverse problems; logic and foundations; mathematical physics; numerical analysis; operation research; statistics and probability.

Major Scientific Results or Products: Staff of 120 PhDs who teach and carry out research in several branches of pure and applied mathematics, mathematical physics and statistics; 547 undergraduate students and 295 graduate students, 206 working on MSc and 89 on PhD degree.

Main Research Facilities Available: Library with 21,795 books and 931 journal titles, with computerized catalogue; 200 microcomputers PC (Pentium) and 40 workstations SUN; access for members to several software packages such as Mathematica, Maple V.4, Reduce 3.5, Matlab 4.2c, Scilab 2.2, Axion 2.1, etc.

Future Development Plans: To offer summer lectures on advanced mathematical topics given by prominent mathematicians.

International Cooperation Arrangements: With colleagues in several institutions around world; received more than 30 invited professors and researchers from several countries in 1997.

Universidade Federal de Pernambuco Departamento de Matematica

Address: Av. Prof. Luiz Freire, S/N, 50740-540, Cidade Universitária, Recife, Pernambuco, Brazil.

Phone: (+55 81) 271-8410; **Fax:** (+55 81) 271-8410; **E-mail:** chefia@dmate.ufpe.br.

Number of Research Scientists: 23; **Number of Staff:**

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: *Training activities:* BSc; MSc; PhD and postdoctoral.

Main lines of research: Algebraic Geometry; combinatorial and algebraic topology; hyperbolic geometry; symplectic and Kähler geometry; Hamiltonian systems and celestial mechanics; PDE: Scattering Theory, Spectral Theory and Inverse Problem PDE and Complex Analysis; Nonlinear PDE; mathematical physics; graph theory and combinatorics; computer graphics.

Main Research Facilities Available: Library: 145 current subscribed journals plus approximately 1,200 titles books; computer lab: 08 Sun Workstations plus 30 PC's.

Future Development Plans: Strengthen PhD programme, including hiring experimental researchers; increase scientific interchanges with institutions abroad; develop applications of mathematics to real world problems.

International Cooperation Arrangements: International cooperation programme on theme "Periodic Orbits and Dynamical Systems," involving five other universities (2 in Latin America, UAM/Mexico, Univ. Rep. Uruguay and 3 in Spain, UAB, Barcelona, Univ. of Valencia, and Univ. Girona).

Chile

Universidad de Chile Departamento de Matematica

Address: Facultad de Ciencias, Casilla 653, Santiago, Chile. **Phone:** (+56 2) 2713882; **Fax:** (+56 2) 2713882; **E-mail:** obarriga@uchdci.o1.bitnet.

Director/Head: Oscar Barriga.

Number of Research Scientists: 16; **Number of Staff:** 3.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Finite groups and geometry; number theory; differential equations; dynamical systems; non-associative algebras; field theory; group representation; nonlinear analysis; topology; quadratic forms; harmonic analysis.

Major Scientific Results or Products: On average, 12 articles per year published in international journals.

Main Research Facilities Available: Library; six computers MULTITECH, model ACER 910, 3 Star character printer model NX 15; laser printer.

Future Development Plans: To increase number of faculty members in support of new undergraduate programme (Bachelor degree in science); supervise more graduate students from other developing countries and other cities in Chile.

Cooperation Arrangements with Developing Countries: Brazil (Convenio CNPq-CONICYT); Uruguay; Argentina.

Other International Cooperation Arrangements: Federation Arrangement with International Centre for Theoretical Physics (ICTP), Trieste, Italy; arrangements with Deutscher Akademischer Austauschdienst (DAAD) and Coopération Scientifique du Gouvernement Français.

China

Chinese Academy of Sciences (CAS) Institute of Applied Mathematics

Address: Beijing 100080, China. **Phone:** (+86 1) 256-1440; **Fax:** (+86 1) 254-1689.

Director/Head: Xiang-Sun Zhang.

Number of Research Scientists: 115; **Number of Staff:** 30.

Scientific Fields of Interest: Applied Mathematics.

Main Lines of Research and Training Activities: *Department of Operations Research:* combinatorial optimization, mathematical programming, graph theory, reliability theory, stochastic optimization, computational complexity. *Department of Probability and Statistics:* stochastic analysis, time series analysis, multivariate analysis and distribution theory, experimental design. *Department of Differential Equation and Computational Physics:* P.D.E. O.D.E. computational physics, numerical analysis.

Department of Decision Science: management information system, economic-mathematical modelling, mathematical physics, decision study. Laboratory of Mathematical Modelling and Information Systems (LMMIS): neural network, wavelet analysis, pattern recognition, theory and application of information systems, computer simulation.

Major Scientific Results or Products: About 150 research papers and 10 application projects per year; in past decade, about 71 research and application results received national awards and prizes from Academy.

Main Research Facilities Available: Library, 50 PCs; 10 Sun Workstations.

Future Development Plans: Prominent centre of applied mathematics research and application in China; plan to make it a research centre in applied mathematics in Asian region by enrolling young excellent scientists and increasing cooperation with developing countries.

Cooperation Arrangements with Developing Countries: Personal cooperation with developing countries such as India, Iran, Pakistan, but no formal agreements exist between institutes because of lack of supporting funds.

Other International Cooperation Arrangements: Asian-Pacific Operations Research Center (APORC) within CAS and Asia-Pacific Association of OR Societies built in 1994; research cooperation currently supported by Chinese Academy of Sciences for scientific personnel visits to Western countries.

Chinese Academy of Sciences (CAS) Institute of Mathematics

Address: A1 South 4th Street, Zhong Guan Cun, Beijing 100080, China. **Phone:** (+86 1) 2553376; **Fax:** (+86 10) 62568356.

Director/Head: Yang Le.

Number of Research Scientists: 90; **Number of Staff:** 17.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Theoretical mathematics; Numerical analysis; Computer sciences.

Major Scientific Results or Products: More than 110 papers every year; development of software products.

Main Research Facilities Available: 30 Personal computers; VAX, 3100; SUN Server 1104 with 12 terminals (SUN Classic station) 2 SUN SPARC Station 10; a library with 150,000 volumes.

Future Development Plans: To continue research on pure and applied mathematics and computer sciences at higher level and carry out scientific exchanges with foreign institutions, especially institutions in Asia and Pacific region.

Chinese Academy of Sciences (CAS) Institute of Systems Science

Address: NanSi St. A-1, Zhongguan Cun, Hai Dian, Beijing 100080, China. **Phone:** (+86 10) 6255-3063; 6255-3005; **Fax:** (+86 10) 6256-8364.

Director/Head: Chen Han-Fu.

Number of Research Scientists: 104; **Number of Staff:** 37.

Scientific Fields of Interest: Engineering/Technology; Environment; Mathematics.

Main Lines of Research and Training Activities: Division of Systems operational research and management; systems and control; statistics and computing science; basic and applied mathematics; mathematics mechanization research centre.

Major Scientific Results or Products: Publish an average of 150 papers and books per year.

Main Research Facilities Available: 10 Workstations; 96 PC; library.

Future Development Plans: Focus on systems science and mathematics.

Fudan University Institute of Mathematics

Address: Shanghai 200433, China. **Phone:** (+86 21) 5494190; **Telex:** 33317 HUA FU CN; **Fax:** (+86 21) 5494190; **E-mail:** guch@bepc2.ihep.ac.cn.

Director/Head: Gu Chao hao.

Number of Research Scientists: 46; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Pure mathematics (differential geometry, functional analysis, partial differential equations, mathematical physics, abstract algebra, algebraic geometry, complex analysis). Applied mathematics (industrial applied mathematics, control theory, computational mathematics, operational research, mathematical statistics). Nonlinear science (soliton, chaos and applications, dynamical systems of infinite dimensions).

Major Scientific Results or Products: Each year more than 100 papers published in international and domestic journals; progress in following areas: quasilinear hyperbolic systems mixed type equations in n-dimensional space, Yang-Mills equations and harmonic maps, functional analysis and spectral analysis of operators, structure theory rings, theory of optimal control for systems with distribution parameters, soliton theory; awarded 45 prizes (national and local).

Main Research Facilities Available: Library with 84,000 books and 600 journals on mathematics; computing laboratory with HP 9000 work station, 10 terminals and 20 personal computers.

Future Development Plans: Train more excellent young mathematicians; obtain important research results in some fields; develop more domestic and international cooperation; become more open to the world.

Cooperation Arrangements with Developing Countries: Plan to exchange visiting scholars and accept more postdoctoral researchers from developing countries as well as from China.

Other International Cooperation Arrangements: Federation agreement with ICTP; cooperation programme with Université VI and INRIA, France; frequently exchange visitors and preprints with institutions such as Courant Institute of New York University, Tokyo University, Heidelberg University, Ecole Normale Supérieur de Lyon.

Nankai University Nankai Institute of Mathematics

Address: Weijin Road 94, Tianjin, China.

Director/Head: Zhou Xingwei.

Number of Research Scientists: 20; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics; Physics/Astronomy.

Main Lines of Research and Training Activities: Hold special courses annually in different areas of mathematics and invite specialists in these areas to carry out research and teach; offer approx. 20 courses for graduate students each year; regular research, mainly in Lie groups, differential geometry, nonlinear analysis, algebraic topology, combinatorial mathematics, theoretical computer and theoretical physics.

Major Scientific Results or Products: Published 300 research papers in academic publications.

Main Research Facilities Available: Library with 23,000 books and 600 classes of publications of mathematics; 6 sets of minicomputers.

Future Development Plans: Expect number of research scientists to reach 30 in several years.

International Cooperation Arrangements: With International Centre of Theoretical Physics, Trieste, Italy.

Peking University Department of Mathematics and Institute of Mathematics

Address: Hai Dian, Beijing 100 871, China. **Phone:** (+86 1) 2501804; **Telex:** 22239 PKUNI CN; **Fax:** (+86 1) 2501801.

Director/Head: Ying Lung-an (Chairman of Department); Chang Kung-ching (Director of Institute).

Number of Research Scientists: 110; **Number of Staff:** 15.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Pure mathematics (sections: analysis, geometry and algebra, differential equations, advanced mathematics); computational mathematics; applied mathematics; information sciences.

Major Scientific Results or Products: About 50 projects supported by Third World Academy of Sciences (TWAS), government and industries; publish about 150 papers each year; obtained more than 100 awards during past 10 years.

Main Research Facilities Available: Computing laboratory (100 personal computers and 5 workstations); computer centre; library.

Future Development Plans: 7000 square metre building (including laboratory and library) being designed; admit visiting scholars (domestic and foreign).

University of Science and Technology of China (USTC) Institute of Mathematics

Address: Hefei, Anhui, 230 026, China. **Phone:** (+86 551) 331 134-239; **Telex:** 90028 USTC CN; **Fax:** (+86 551) 331760.

Number of Research Scientists: 51; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Theory of several complex variable function; algebra number theory and analytic number theory; differential geometry and differential equations; algebra; dynamical systems and topology; limit theory; parametric estimation and nonparametric statistics; linear models and multivariate analysis; reliability; finite elements; computer aided geometric design; numerical analysis; spline and approximation numerical methods for PDE and computational fluid dynamics; soliton and integrable systems; bifurcation; combinatorics and graph theory; coding theory; control theory and operational research; theory of partial differential equations and its applications.

Major Scientific Results or Products: Each year, publish approx. 100 papers in international and domestic journals; main scientific research achievements (all winners of 2nd awards or higher at ministerial or provincial level): geometric theory of one complex variable functions; one complex variable and several complex variables function theory; Schlicht functions; Galois structure of algebraic number fields; subgroup systems of finite simple groups of Lie-type; relations among periodic sets, recurrent sets and non-wandering sets of continuous maps of the interval; consistency of estimate of error variance in linear models; several problems of limits; theory in mathematical statistics; spline finite element; theory of finite elements and its applications; study of convergence of non-uniform finite element; study of soliton and nonlinear evolution equation; Bernstein-Bezier surface; soliton theory.

Main Research Facilities Available: Sun-4110 Station with 16 terminals, 9 computers of IBM PC series; 4 super-386 computers; library.

Future Development Plans: To progress in following areas: differential geometry and PDE; real and complex analysis; nonlinear science especially dynamic systems; discrete math. and its application;

analysis and algebraic number theory; numerical approximation; computer aided geometric design; probability and statistics.

Cooperation Arrangements with Developing Countries: Plan to exchange visiting scholars with developing countries.

Other International Cooperation Arrangements: Exchange Programme with Moscow University; Federation Agreement with the International Centre for Theoretical Physics (ICTP); Exchange Programme with Maryland University; Exchange Programme with Purdue University.

Cte dlvoire

Institut de Recherches Mathmatiques (IRMA)

Address: 01 BP 2030, Abidjan 08, Cote d'Ivoire. **Phone:** (+225) 445886; **Telex:** 26138.

Director/Head: S. Touré.

Number of Research Scientists: 19; **Number of Staff:** 12.

Scientific Fields of Interest: Engineering/Technology; Mathematics.

Main Lines of Research and Training Activities: Algebra; probability, statistics and applications; numerical analysis; computer science; pedagogy of mathematics for secondary school teachers; textbooks for secondary school.

Major Scientific Results or Products: Publications; PhD theses; textbooks for secondary schools.

Main Research Facilities Available: Library; IBM PCs and compatible ones; macintoshes.

Future Development Plans: Computer software for mathematical education.

Cooperation Arrangements with Developing Countries: New textbooks for being written for secondary schools (Côte d'Ivoire, Guinea, Cameroon, Burkina-Faso, Niger, Congo, Senegal, Gabon, Togo, Benin); Mali, Madagascar have already expressed interest in textbooks, which will soon be used throughout French speaking Africa.

India

Central Arid Zone Research Institute (CAZRI)

Address: Jodhpur 342 003, India. **Phone:** (+91 291) 40584; **Telex:** 091-291-522-218 CZRI IN; **Fax:** (+91 291) 40706.

Director/Head: A.S. Paroda.

Number of Research Scientists: 150; **Number of Staff:** 700.

Scientific Fields of Interest: Agriculture; Biology; Biochemistry/Biophysics; Energy; Earth Sciences; Environment; Veterinary Sciences.

Main Lines of Research and Training Activities: Arid zone agriculture; Resource inventory and monitoring; Desertification causes - extend and control measures; Management of rain, ground and surface water; Rehabilitation of degraded lands - integrated farming systems; Integrated pest management (IPM) livestock management and production; Improvement of annual and perennial crops, evaluation of under-exploited plants and their product; Solar and wind energy; Biodiversity; Post-harvest, socioeconomic studies; Transfer of technology, etc.; Integrated watershed management, biotechnology; Post-harvest technology, agro-product processing and value addition, technology transfer, socioeconomic investigations and evaluation; Training and communication research.

Major Scientific Results or Products: Preparation of desertification map of western Rajasthan water prospecting from buried channels and index catchments; standardization of water harvesting structures, optimization of water use in desert crops, use of sprinklers and drips; conservation of water through fly ash, vegetative barriers, fertigation, sand dune stabilization, management of salinity-in situ and high RSC

water; evolving new varieties of Moth bean, cluster bean, Kulthi and Zuzube; agrotechniques of pearl millet and Zuzube and many forestry species; management of rangelands and livestock, standardization of solar based devices.

Main Research Facilities Available: Advance equipment like GIS, LAN and computers available; GPS, spectrometer, GLC, seed germinators and incubator, laminar flow weatherometer, ovens, shakers, balances, GAS chromatogram, atomic absorption, spectrophotometer, radiometer, Kjeldahl system, psychrometer, bomb calorimeter, plot forage harvester, ponometers, neutron moisture meter, GVM, anemometer, seismic recorder, greenhouse, leaf area meter, gamma sampler charger, photosynthetic system, plant canopy analyser. Eight large experimental field areas in different rainfall zones. CAZRI has Raheja; library with 11,000 books and subscriptions to 228 national and international journals.

Future Development Plans: Inventory of soil-land-water-plant-animal continuum; desertification processes to develop control measures; basic and applied research for evolving strategies in the arid ecosystems; GIS based resource inventory; desertification monitoring; biodiversity; dry land farming; desert irrigation; integrated watershed management; biotechnological and conventional breeding programme for animals; perennial crops and livestock; biocompound search and value addition; solar and photovoltaic systems; socioeconomics and technology transfer strategies.

Cooperation Arrangements with Developing Countries: Under SAARC agreements; additional agreements based on mutual interests.

Other International Cooperation Arrangements: UNESCO, USAID, FAO, UNDP, ICRISAT, UNEP, European Commission, IFAD.

Indian Statistical Institute, Calcutta

Address: 203 Barrackpore Trunk Road, Calcutta 700 035, India. **Phone:** (+91 33) 5568049; **Telex:** 21-2210 STAT IN; **Fax:** (+91 33) 5566680; **E-mail:** blspr@isical.ernet.in.

Director/Head: B.L.S. Prakasa Rao.

Number of Research Scientists: 189; **Number of Staff:** 328.

Scientific Fields of Interest: Agriculture; Biology; Biochemistry/Biophysics; Chemistry; Geological/Earth Sciences; Mathematics; Physics/Astronomy.

Main Lines of Research and Training Activities: *Theoretical Statistics and Mathematics Division:* probability theory and stochastic processes; statistical inference; multivariate analysis; design and analysis of experiments; sample surveys; reliability; combinatorics; graph theory and theoretical computer science; geometry of Banach spaces; functional and harmonic analysis; C^* and von Neumann algebras; spectral theory; descriptive set theory; algebraic and combinatorial topology; differential topology; differential geometry; linear and multilinear algebra; representation theory of finite and continuous groups. *Applied Statistics, Surveys and Computing Division:* sample surveys; multivariate analysis; design of experiments; software reliability; biometry. *Social Sciences Division:* economics, econometrics and planning; sociology; linguistics; population studies; psychometry. *Biological Sciences Division:* anthropometry and human genetics; biochemistry; leaf protein; embryology; agricultural sciences. *SQC and OR Division:* acceptance sampling; process control; design of experiments; reliability; mathematical programming; optimum investment in drilling. *Library, Documentation and Information Sciences Division:* Classaurus design; multiaccess thesaurus design; management information systems; bibliometry; computerized manpower planning; offer courses in Bachelor of Statistics (BStat. Honours) and Master of Statistics (MStat.); confers the degree of Doctor of Philosophy in Statistics.

Major Scientific Results or Products: Fundamental advances in theoretical and applied statistics and mathematics: "Plancherel-type" theorem for measures theory obtained for Hermite and Laguerre expansion; efforts to study convergence of Bayesian Inference in determining truth in infinite dimensional case on consistency of posterior for non-parametric problem of density estimation; interdisciplinary projects, macroeconomic management in underdeveloped economy has shown impact of government budgeting and expenditure and foreign trade sector in Indian context; new light thrown on use of computer in defence control by research on "computer application for recognition and interpretation of acoustic radar imageries;" programme on Total Quality Management (TQM) and ISO 9000 has trained young executives in quality control techniques.

Main Research Facilities Available: PCs and research equipment; computer and statistical service centre; library.

Future Development Plans: Studies on Generalised Fock spaces, circle of geometry and abstract interpolation undertaken; convergence of Bayesian inference will continue; "Demand for Rural Industries Product in India" sponsored by South Asia Multidisciplinary Advisory Team, ILO, The Total Quality

Management (TQM) training; extension of research on chemoprevention of Uterian Cervix Cancer; further study on MAP estimation problem; demographic and epidemiological transition in India will continue.

Cooperation Arrangements with Developing Countries: Participation in scientific exchange programmes through government of India undertaken; conducting 46th term with 20 trainees from 9 different countries of South and South-East Asia, Middle East, Far East and Commonwealth of Africa.

Other International Cooperation Arrangements: Operates International Statistical Education Centre jointly with International Statistical Institute and UN Educational, Scientific and Cultural Organization (UNESCO).

Indian Statistical Institute, Bangalore

Address: 8th Mile, Mysore Road, R.V. College post, Bangalore 560 059, India. **Phone:** (+91 80) 623616, 604648, 604485; **Telex:** 845-8376 ISIB IN; **Fax:** (+91 80) 8430265, **E-mail:** ISIB@ISIBang.ernet.in.

Director/Head: T.S. Arthanari.

Number of Research Scientists: 28; **Number of Staff:** 70.

Scientific Fields of Interest: Mathematics; Statistics; Economics; Information Science; SQC &OR.

Main Lines of Research and Training Activities: Geometry of Banach spaces; operator theory; operator algebra; harmonic analysis; differential geometry; differential operators; combinatorics; design of experiments; probability theory; Bayesian theory; sampling theory, generalized inverses of matrices, finitely additive measure theory, diffusion processors; growth, stability and variability of agricultural production; plan models; poverty and income distribution in India; price formation and monetary economics; conceptual structures for knowledge organization tools in expert systems, planning, design and development of information analysis and consolidation products; economic design of control charts; bicriterion optimization in networks and transportation; two dimensional cutting stock problem; quality engineering and optimization.

Major Scientific Results or Products: Proved conditional gauge theorem for third boundary value problem; investigated various aspects of Pompei problem and uncertainty principle; conducted studies on mean periodic functions on reduced Heisenberg group; obtained some results related to problem of computing principal graph of subfactor from vertex model; developed econometric methodology appropriate for assessing different kinds of (in) stability in crop; developed new techniques in geometry of Banach spaces that lead to better understanding of position of compact apertures in space of bounded operators; obtained classification and structure theorem for combinatorial δ -dimensional spheres on $d + 4$ vertices; in area of nonparametric Bayesian inference, developed methods for analysing data arising from smooth regression functions but contaminated by random noise; created package for two dimensional cutting stock problem and for LP.

Main Research Facilities Available: 30 computers and Sun workstation with LAN; library.

Future Development Plans: To develop as centre for excellence in fields of research mentioned above; help industry; create quality information centre.

Cooperation Arrangements with Developing Countries: Students from developing countries visit Centre headquarters under ISEC Programme at Calcutta; students also visit Centre for short periods.

Indian Statistical Institute, New Delhi

Address: 7 SJS Sansanwal Marg, New Delhi 110 016, India. **Phone:** (+91 11) 664741, 664592, 664789; **Fax:** (+91 11) 685779; **E-mail:** isidel@isid.ernet.in.

Director/Head: Atul Sarma.

Number of Research Scientists: 49; **Number of Staff:** 30.

Scientific Fields of Interest: Mathematics; Economics operation research and quality control.

Main Lines of Research and Training Activities: Teaching and research in statistics, mathematics, economics, statistical quality control and operations research.

Major Scientific Results or Products: Publications in major journals.

Major Research Facilities Available: Computers and library.

International Cooperation Arrangements: The International Statistical Education Centre established in the Institute in 1950, is run in collaboration with the International Statistical Institute under the auspices of the UNESCO and Govt. of India. This Centre has been providing training in statistics to sponsored

students mainly from Asia, Africa and Far East. The Centre also offers various short-term courses in statistics.

Institute of Mathematical Sciences

Address: CIT Campus, Chennai (formerly Madras) 600 113, India. **Phone:** (+91 44) 2351856, 2351049, 2352267; **Telex:** 041-8960 PCO INPP WDT 20; **Fax:** (+91 44) -2350586; **E-mail:** postmaster@imsc.emet.in.

Director/Head: R. Ramachandran.

Number of Research Scientists: 49; **Number of Staff:** 30.

Scientific Fields of Interest: Mathematics; Theoretical Physics; Theoretical Computer Science.

Main Lines of Research and Training Activities: *Theoretical Physics:* conformal field theory, lattice gauge theory, quantum field theory, quantum groups, string theory, phenomenology, QCD, high T_c superconductivity, quantum Hall effect, quantum magnetism, quantum groups, quantum optics, nonlinear systems. *Mathematics:* algebraic and analytic number theory, complex analysis, differential geometry, functional analysis, harmonic analysis, partial differential equation, probability theory. *Theoretical Computer Science:* algorithms and complexity, automata theory, distributed computing, logics of programmes, semantics.

Major Scientific Results or Products: Internationally recognized institute in theoretical physics and mathematics.

Major Research Facilities Available: Library with about 30,000 volumes and journal subscriptions to major international journals in fields of theoretical physics, mathematics and computer science; network of Sun sparcs stations, AT386's and Hewlett-Packard HP 9000/835 system; number of multi CPU high performance work stations and large number of PC-XT's and AT's; symbolic Manipulation programmes like MACSYMA, FORM and MATHEMATICA.

Future Development Plans: Phase of rapid growth in place; large-scale expansion anticipated in all areas, including newly emerging ones; library automation has been undertaken.

International Cooperation Arrangements: Federation Agreement with International Centre for Theoretical Physics (ICTP), Trieste, Italy.

Iran, Islamic Rep.

Kerman University Department of Mathematics

Address: Kerman, Iran, Islamic Rep. **Phone:** (+98 341) 235392; **Fax:** (+98 341) 263244.

Director/Head: Y. Bahrampour.

Number of Research Scientists: 30; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Fuzzy Mathematics and applications; Analysis: Operators and control; Geometry: Super-spaces and twisters; Statistics: Stochastic model building.

Major Scientific Results or Products: Published about 100 papers in local and international journals as well as several books.

Main Research Facilities Available: 1 Sun Workstation; 50 PC's.

Future Development Plans: Extend PhD programme; plan to set up faculty of mathematical sciences.

Cooperation Arrangements with Developing Countries: Plan to start exchange programmes with neighbouring countries.

Sharif University of Technology Department of Mathematical Sciences

Address: P.O. Box 11365-9415, Tehran, Iran, Islamic Rep. **Phone:** (+98 21) 600-5117; **Fax:** (+98 21) 600-5117; **E-mail:** dept@math.sharif.ac.ir.

Director/Head: Yahya Tabesh.

Number of Research Scientists: 16; **Number of Staff:** 9.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Dynamical systems; Combinatorics; Diff. eq.; Stochastic analysis; Numerical analysis; Noncommutative algebra; PDE; Logic.

Major Scientific Results or Products: In past three years, 75 research papers published and 9 students have obtained PhD degree.

Main Research Facilities Available: 40 PCs; 15 workstations; 6 laser printers.

Future Development Plans: Employ more scientists; develop PhD programme; develop postdoctoral programme.

Cooperation Arrangements with Developing Countries: Department of Mathematics, Isfahan University of Technology, Isfahan, Iran.

Shiraz University Department of Mathematics

Address: College of Science, Shiraz 71454, Iran, Islamic Rep. **Phone:** (+98 71) 41334; **Fax:** (+98 71) 20027.

Director/Head: M. Ershad.

Number of Research Scientists: 18; **Number of Staff:** 5.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Operator theory; algebra; C^* -algebra; algebraic topology.

Major Scientific Results or Products: Published more than 30 papers in international journals of mathematics and about 5 books.

Main Research Facilities Available: 12 PCs; library.

Future Development Plans: Develop MSc and PhD programmes; at present, there are 20 MSc and 10 PhD students.

Cooperation Arrangements with Developing Countries: Exchange programmes with neighbouring countries; however, they need to be improved.

Mexico

Centro de Investigacin en Matemáticas (CIMAT)

Address: Callejón Jalisco s/n, Valencian, Guanajuato, Gto. Mexico. **Phone:** (+52 473) 27155; **Fax:** (+52 473) 25749; **E-mail:** cimat@unamvm1.bitnet.

Director/Head: José A. Canavati.

Number of Research Scientists: 19; **Number of Staff:** 7.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Pure mathematics: differential geometrical methods in physics; functional analysis; dynamical systems; probability and statistics: probability theory; mathematical statistics; applied statistics; computer science: pattern recognition; computer aided design; quality control.

Major Scientific Results or Products: Mathematical models for pollution by ozone; software for the shoe industry; implementation of mathematical models for quality control in industry.

Main Research Facilities Available: Computer centre with networked PC in each office; library with 8,000 volumes and subscription to 135 journals; guesthouse with housing for 50 people; seminar building with seven seminar rooms, including auditorium.

Future Development Plans: To improve staff in all areas, especially those involved in applications.

International Cooperation Arrangements: Cuba. ICTP, Italy and CNRS, France.

Centro de Investigacin y de Estudios Avanzados (CINVESTAV) del IPN Departamento de Matemáticas

Address: Apartado Postal 14-740, 07000 Mexico D.F. Mexico. **Phone:** (+52 5) 747-7103; **Fax:** (+52 5) 747-7104; **E-mail:** ohernand@math.cinvestav.mx.

Director/Head: Onésimo Hernández-Lerma.

Number of Research Scientists: 23 (all PhDs); **Number of Staff:** 9.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Functional analysis; Numerical analysis; Combinatorics; Stochastic control; Differential equations; Algebraic geometry; Differential geometry; Mathematical logic; Probability; Algebraic topology; Theory of numbers; Complete variables.

Major Scientific Results or Products: Books, monographs and papers in international mathematical journals.

Main Research Facilities Available: Library with about 15,000 books and about 300 journal subscriptions; computing system with 4 workstations and about 20 PCs.

Future Development Plans: Moving to new larger building by end of year, hiring several new faculty members and enlarging computer laboratory.

Cooperation Arrangements with Developing Countries: Cooperation agreements through Mexican Foreign Ministry and National S&T Council (CONACYT).

Universidad Nacional Autnoma de Mxico (UNAM) Instituto de Matemtica

Address: Ciudad Universitaria, 04510 Mexico, D.F. Mexico. **Phone:** 622-45-23; **Fax:** 550-13-42; **E-mail:** peimbert@servidor.unam.mx.

Director/Head: Luis Montejano-Peimbert.

Number of Research Scientists: 63; **Number of Staff:** 44.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Algebra (cohomology of groups, representation of algebras, ring theory); Algebraic geometry; Analysis (operator theory, harmonic analysis, probability, nonlinear analysis); Combinatorics, graph theory; Dynamical systems; Geometry, Convexity; Mathematical Physics; Topology (General Topology, Low-dimensional Topology, Algebraic and Differential Topology, Knot theory).

Major Scientific Results or Products: Published 50 research papers and 5 books in 1995.

Main Research Facilities Available: Library with more than 20,000 books and nearly 400 journals; 36 computers (486); 25 work stations.

Future Development Plans: Established research centre in Morelia (200 miles west of Mexico City) in 1990, where 10 mathematicians now work; plan to establish another centre in Cuernavaca (60 miles south of Mexico City).

Cooperation Arrangements with Developing Countries: Academy of Sciences, Cuba.

Other International Cooperation Arrangements: DAAD, Germany; NSF, USA; CNRS, France; JSPS, Japan; Spain.

Universidad Nacional Autnoma de Mxico (UNAM) Institute of Research in Applied Mathematics and Systems

Address: Ciudad Universitaria, Del. Coyoacan, 04510 Mexico, D.F., Mexico. **Phone:** (+52 5) 622-3555; **Fax:** (+52 5) 550-0047; **E-mail:** imendez@redvaxl.dgsca.unam.mx.

Director/Head: Ignacio Mendez Ramirez.

Number of Research Scientists: 48; **Number of Staff:** 43.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Computer sciences department; electronics and automation department; mathematics and mechanics department; mathematical modelling department; mathematical and numerical department; probability and statistics department.

Major Scientific Results or Products: Published 55 articles in international periodical journals in 1994.

Main Research Facilities Available: Library: 27,285 volumes on applied mathematics, computer sciences, probability, statistics, electronics and automation; 750 technical booklets and 292 undergraduate and graduate theses; subscribe to 449 journals; computers: 14 Sun workstations, 3 notebooks, 10 Macintoshes, minicomputer silicon graphics, minicomputer microvax, minicomputer HP and microcomputer 80486 70.

International Cooperation Arrangements: 5 arrangements with European countries; one arrangement with USA.

Morocco

Universit Mohammed V Dpartement de Mathmatiques, Facult des Sciences

Address: B.P. 1014, Rabat, Morocco. **Phone:** (+212) 7775471; **Fax:** (+212) 7775471.

Director/Head: Abdelhamid Bourass.

Number of Research Scientists: 70; **Number of Staff:** 10.

Scientific Fields of Interest: Mathematics; Computer Science.

Main Lines of Research and Training Activities: Number theory; Commutative algebra; Complex analysis; Functional analysis; Nonlinear analysis; Algebra; Optimal control; Statistics, Probability; Non associative algebra; Numerical analysis; Artificial intelligence; Algorithms; Parallelism; Analysis of data; Structure of data.

Major Scientific Results or Products: Theses (50 Masters and 7 PhD); Publications in international journals.

Main Research Facilities Available: Library with 300 books for teaching and 540 books for research; 60 journals; 7 microcomputers.

Future Development Plans: Seek to combine applied mathematics and computer science research; train assistants in computer science.

International Cooperation Arrangements: Scientific cooperation with France, Belgium in mathematics.

Nigeria

National Mathematical Centre

Address: Block 11, Zone 3, Wuse, Private Mail Bag 118, Abuja, Nigeria. **Phone:** (+234 9) 5230784; 5230616; 5230617; 5230618; **Telex:** 71494 ABJ NG TDS 60; **Fax:** (+234 9) 5230783.

Number of Research Scientists: 6 full-time; 35 part-time; **Number of Staff:** 72.

Scientific Fields of Interest: Engineering/Technology; Mathematics; Physics/Astronomy; Statistics.

Main Lines of Research and Training Activities: Courses run or planned in areas of algebra, analysis, differential geometry, applied algebraic geometry, probability theory, asymptotic inferences and optimization; research activities planned in commutative algebra, harmonic analysis, algebraic K theory, nonlinear boundary value problems; workshops on dynamical systems and application of mathematics to material sciences; other activities in area of mathematics education.

Major Scientific Results or Products: Growing impact on research and postgraduate training (including curriculum) in mathematics in universities; foundation being laid for tackling the problem of ineffective teaching/learning of mathematical sciences at secondary and primary levels.

Main Research Facilities Available: Mathematical sciences library opened and now operational; computing laboratory to be established.

Future Development Plans: Master plan to develop permanent site now at advanced stage of completion.

Cooperation Arrangements with Developing Countries: African universities encouraged to participate in our FPC-and RLS-activities and workshops through invitations; library information bulletins on new acquisitions now reach outside universities; expert mathematicians from outside (Côte d'Ivoire for example) give regular courses (RLS, FPC) at Centre.

Other International Cooperation Arrangements: Contact with various bodies in Europe and America is being expanded and gradually yielding good results; donations of books/journals/back issues continue to be solicited on Centre's behalf or by various bodies, including ETH Zürich, Kluwer Academic Publishers; scientists now offer their expert services to Centre.

University of Ibadan Department of Mathematics

Address: Ibadan, Nigeria. **Phone:** (+234 2) 810-1100 ext. 1400, 1894, 1930; **Fax:** (+234 2) 810-3043.

Director/Head: G.O.S. Ekhaguere.

Number of Research Scientists: 45; **Number of Staff:** 35.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Algebras; algebraic K-theory; algebraic number theory; algebraic topology; theory of flag manifolds and flag bundles; ordinary differential equations; integral equations; functional analysis; probability theory; stochastic analysis; noncommutative probability theory; mathematical physics; operations research; variational inequalities; biomathematics; nonlinear analysis; group representations; harmonic analysis; dynamical systems; continuum mechanics; quantum theory; fractals; numerical analysis.

Major Scientific Results or Products: Published books and articles in international research journals.

Main Research Facilities Available: Several XT; 386 AT and 486 AT IBM compatible PCs; matrix and laser printers; mathematics library.

Future Development Plans: Strengthen academic staff strength; strengthen existing research groups and encourage their involvement in national development; introduce new mathematics-based courses for national development; expand available teaching/research facilities; solicit donation of equipment by foreign sources; increase student enrolment in mathematics; develop collaborative/network/twinning links with some mathematics departments in and outside Nigeria.

International Cooperation Arrangements: Interested in developing collaborative/network/twinning arrangements with mathematics departments in developing countries. Already involved in foreign programmes such as ICTP Federation/Associateship Scheme and Exchange Programme of the DAAD, Germany.

University of Nigeria Department of Mathematics

Address: Nsukka, Nigeria. **Phone:** (+234 42) 771911 Ext. 2.

Director/Head: Eke Ukeje.

Number of Research Scientists: 15; **Number of Staff:** 4.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Functional analysis; mechanics of solids; high energy and particle physics; operations research, ordinary differential equations and partial differential equations; teaching at MSc level and thesis supervision at MSc and PhD levels.

Major Scientific Results or Products: Publications in scientific journals.

Main Research Facilities Available: University main library.

Future Development Plans: Depends on availability of funding; intend to invite experts from outside for research guidance and lecturing.

International Cooperation Arrangements: Federation scheme with International Centre for Theoretical Physics (ICTP) in Trieste, Italy.

Pakistan

Quaid-i-Azam University Department of Mathematics

Address: Islamabad 45320, Pakistan. **Phone:** (+92 51) 829-189; **Telex:** 5602 PIDE PK; **Fax:** (+92 51) 821-387; 829-472.

Director/Head: Saleem Asghar.

Number of Research Scientists: 15; **Number of Staff:** 5.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Functional analysis: operator theory, differential operators and topological vector spaces; Algebra: group theory, ring theory and their generalizations; Relativity: astrophysics and cosmology; Wave motion: electromagnetic, acoustic, elastic waves; Geometry: complex manifolds; Analytical dynamics.

Major Scientific Results or Products: Between 1986-1991, faculty (with 13-16 members) produced about 177 research papers, most published in journals of high international repute and several cited in theses, books and research papers; only institute of mathematics in Pakistan that produces MPhils and PhDs in country (22 PhDs and 250 MPhil); faculty has written several books and is actively cooperating with leading institutions worldwide; have won numerous national and international awards.

Main Research Facilities Available: Computers: linked with mainframe N.E.C.; 16 personal computers and 7 printers.

Future Development Plans: Increase number of faculty members from 15 to 30; develop at least five major fields of specialization — geometry, algebra, functional analysis, wave motion relativity/astrophysics/cosmology and computational fluid dynamics.

Cooperation Arrangements with Developing Countries: Collaborative assistance with institutions in developed countries on individual basis with assistance of aid-giving agencies like USEFP, British Council. Institutions are Austin University, Oxford University, Southampton University, Max Planck Institute, MIT, University of Illinois at Urbana Champaign, USA, UPM, ICTP, TWAS.

Other International Cooperation Arrangements: ICTP and TWAS provide assistance in arranging conferences/workshops in various fields; several faculty members are associate members of ICTP.

Uruguay

Instituto de Matemática y Estadística Prof. Ing. Rafael Laguardia (IMERL)

Address: Facultad de Ingeniería, C.C. No. 30, Montevideo, Uruguay. **Phone:** (+598 2) 710621, 714462; **Telex:** FACUING 23859; **Fax:** (+598 2) 715446; **E-mail:** roma@imerl.edu.uy.

Director/Head: Roberto Markarian.

Number of Research Scientists: 17; **Number of Staff:** 4.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Dynamical systems (theoretical aspects and applications to other scientific and technological branches); expansive homeomorphisms; ergodic theory of dynamical systems with singularities; billiards; bifurcation theory; geodesic and Hamiltonian flows; other lines of research and training include: philosophy of science, mathematics in particular; mathematical economy; general equilibrium; statistics of random processes; analysis and control of queuing systems; new research branches include: robust control; optimization of large dimension problems; optimization of non differentiable functions.

Major Scientific Results or Products: Published 20 paper in international scientific journals in two years.

Future Development Plans: To expand group of dynamical systems from theoretical point of view and applications; to broaden cooperation with foreign institutions by offering graduate courses and guiding their research; to consolidate and widen groups of optimization, control, applied probability and

mathematical economy; to strengthen research by creating interdisciplinary activities with specialists from other scientific and technological branches.

Cooperation Arrangements with Developing Countries: Created association of universities "Grupo de Montevideo" that coordinates graduate and research activities of 10 universities in Argentina, South Brazil, Paraguay and Uruguay; collaborate with these universities by offering graduate courses and guidance for initial research activities in dynamical systems; plan to streamline all these activities in future.

Other International Cooperation Arrangements: Joint research activity with French specialists in dynamical systems and hope for fruitful collaboration with assistance of ECOS Programme; in 1986, with support of UN Development Programme (UNDP), university and government founded PEDECIBA (Programme for Development of Basic Sciences: Biology, Chemistry, Computer Science, Physics and Mathematics); PEDECIBA has frequently collaborated with IMERL.

Venezuela

Instituto Venezolano de Investigaciones Cientificas (IVIC) Department of Mathematics

Address: P.O. Box 21827, Caracas 1020A, Venezuela. **Phone:** (+58 2) 5011412/13; **Telex:** 21657; **Fax:** (+58 2) 5011416; **E-mail:** rsl@ivic.ivic.ve.

Director/Head: Rafael Sánchez.

Number of Research Scientists: 6; **Number of Staff:** 1.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: *Algebra:* Resolutions of Weyl and Schur modules; resolutions of determinant rings structure theory for perfect ideals in Noetherian rings; Cayley-Koszul complex. *Dynamical systems:* Study of homoclinic bifurcations in real and complex systems.

Mathematical logic and foundations of set theory: Infinitary combinatorics and large cardinals. *Operator theory:* Study of dual algebras generated by commuting contractions. *Theory of functions:* Study of Bergman function spaces. *Probability theory:* Sample path properties of random processes; Stochastic partial differential equations. Postgraduate teaching is also carried out in above-mentioned areas.

Major Scientific Results or Products: Seven articles accepted for publication in international journals in mathematics in 1994-1995.

Main Research Facilities Available: Macintosh computers; Sparc station LX, Sun; sparc station IPC; sparc printer; deskwriter printer; personal laserwriter printer.

Future Development Plans: Increase number of research scientists and support staff; increase number of postgraduate students; construct bigger building equipped with all necessary research facilities.

Cooperation Arrangements with Developing Countries: Conselho Nacional de Desenvolvimento Cientifico e Tecnológico (CNPq), Brazil; Universidad de Los Andes, Bogotá, Colombia; affiliations with other institutions in Venezuela, such as Universidad Central de Venezuela (UCV), Universidad Simón Bolívar (USB), Instituto Tecnológico Venezolano del Petróleo (INTEVEP), and Centro Nacional para el Mejoramiento de la Enseñanza de la Ciencia (CENAMEC).

Other International Cooperation Arrangements: Regional programme in mathematics supported by French Cooperation and UN Educational, Scientific and Cultural Organization (UNESCO); CEFI, France.

Vietnam

National Centre for Science and Technology of Vietnam Hanoi Institute of Mathematics

Address: Vien Toan Hoc, P.O. Box 631, Boho, Hanoi, Vietnam. **Phone:** (+84 4) 836 1317; **Fax:** (+84 4) 8343303; **Telex:** 411525 NCSR VT.

Director/Head: Tran Duc Van.

Number of Research Scientists: 78; **Number of Staff:** 7.

Scientific Fields of Interest: Mathematics.

Main Lines of Research and Training Activities: Optimization; dynamical systems; partial differential equations; mathematical physics; probability and mathematical statistics; numerical analysis; functional analysis; geometry and topology; algebra and number theory; discrete mathematics; theoretical informatics.

Major Scientific Results or Products: Published 20 monographs and more than 2,000 research papers in international mathematical journals.

Main Research Facilities Available: Library with 10,000 book and 200 journal titles; photocopier; 2 net servers and 22 PCs.

Future Development Plans: To further develop fundamental research in mathematics; to intensify applications of mathematics to development of economics of Vietnam; to pursue establishment of regional international centre for higher education in mathematics.

International Cooperation Arrangements: Member of Stefan Banach International Mathematical Center in Warsaw (Poland) and federated institute of the International Centre for Theoretical Physics, in Trieste (Italy).