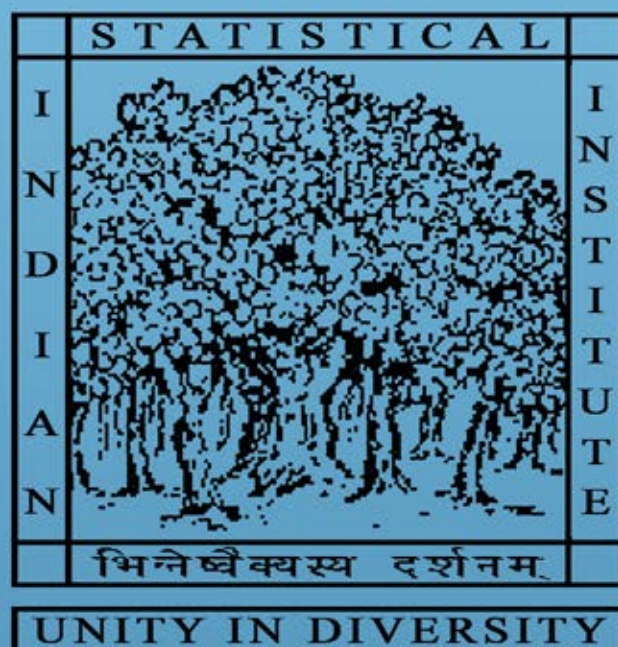
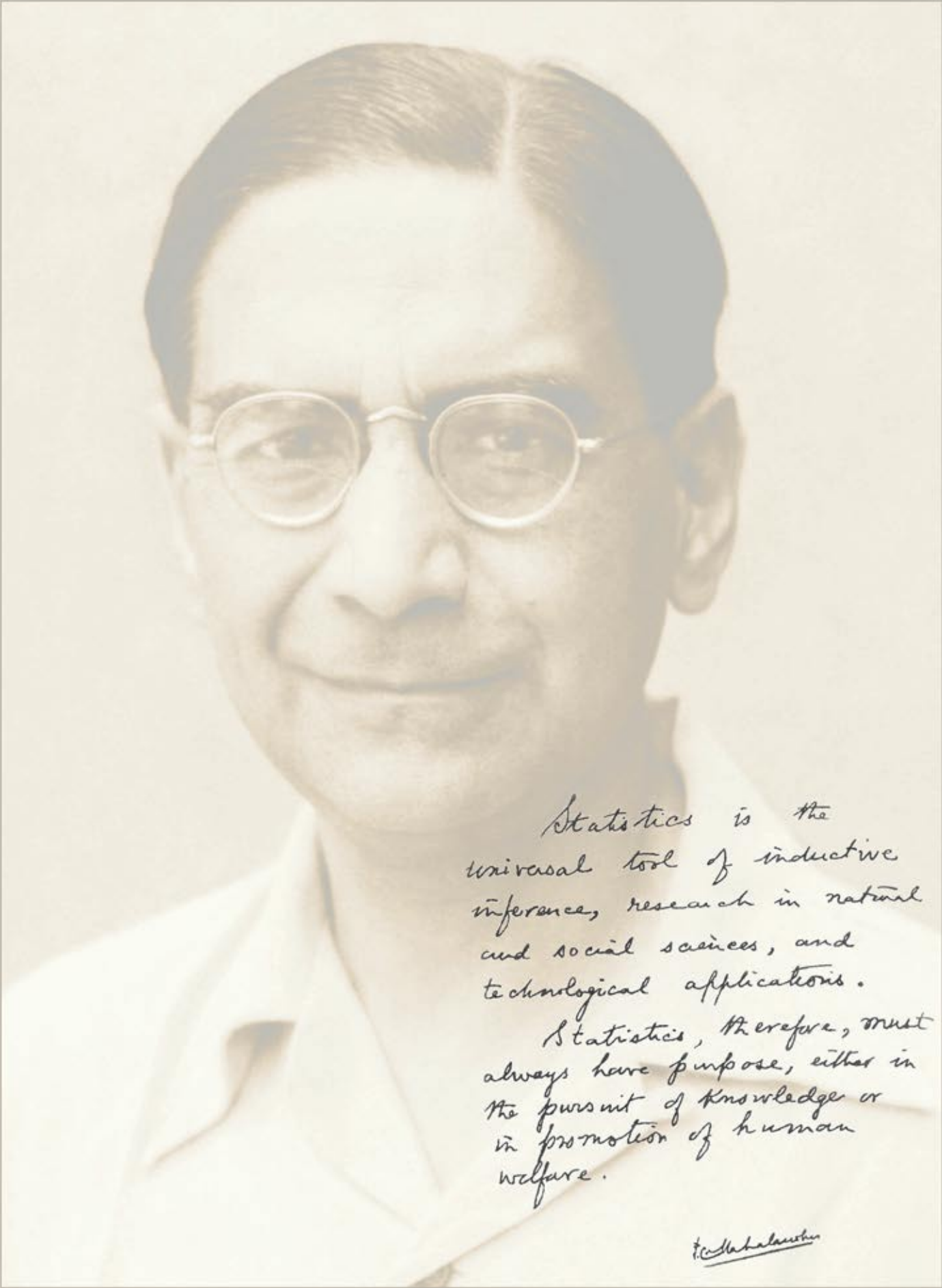


Vibrant



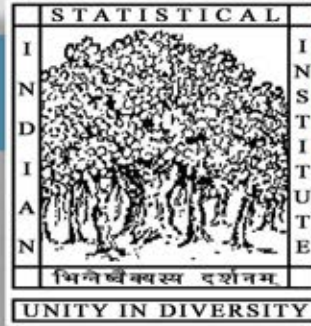
Indian Statistical Institute

A sepia-toned portrait of a middle-aged man with dark hair parted on the side, wearing round-rimmed glasses and a light-colored shirt. He is looking directly at the camera with a slight smile. The background is a plain, light color.

Statistics is the
universal tool of inductive
inference, research in natural
and social sciences, and
technological applications.

Statistics, therefore, must
always have purpose, either in
the pursuit of knowledge or
in promotion of human
welfare.

P. C. Mahalanandhan



Vibrant

Indian Statistical Institute



सत्यमेव जयते

I send my greetings and good wishes to the Indian Statistical Institute on the occasion of its Foundation Day and Convocation ceremony. The Institute was declared by Parliament as one of national importance. Long before this declaration, it had by virtue of its own work assumed that position and, indeed, had received international recognition. I have watched its activities from a distance, and sometimes visited it also during the last 22 years. I have watched its growth under the distinguished guidance of Professor Mahalanobis with great interest and pleasure. It has developed a high status and reputation for creative work. To us, who are devoted to planning for the future growth of India, it is of essential importance.

Statistical science has grown greatly during recent years and the Indian Statistical Institute has participated in and helped in this growth. The part that this Institute has played in India is one of which we may legitimately be proud. I have every hope that the Institute will carry on its work in the future with efficiency and originality, applying it especially to the conditions in India. To Prof. P.C. Mahalanobis specially I send my congratulations.

Jawaharlal Nehru

New Delhi,
February 9, 1962.



Foreword



Launched from the confines of a laboratory at Presidency College, Calcutta, on December 17, 1931 the Indian Statistical Institute has evolved today into a mighty institution for higher learning, and scientific studies and research, winning international acclaim. During this long journey the Institute has virtually redefined the concept of studies and research in statistics, biological sciences, computer science and other related fields.

In the process, the Institute has acquired an impeccable reputation for its critical inputs and contributions to both the public and private sectors in the country, expediting the economic growth and scientific progress of the nation. The Institute has rightfully become a source of inspiration for other similar organizations devoted to the cause of higher education here and abroad. In tune with its distinctive logo, a banyan tree with myriad roots, the organization continues to play a pivotal role in the eternal quest for knowledge, excellence and innovation through its research efforts and studies.

It is a matter of great pride for us that the Institute over the years has succeeded in attracting the best talents of the country as students and faculty. They continue to make their unique contributions in fundamental research, applied sciences and technologies. Today the Institute is uniquely poised to face the challenges posed by a rapidly developing world with its growing complexities and needs because of our pioneering work in areas like computational data science, analytics, human genetics and cryptography. This has been possible through the relentless effort, dedication and hard work of our internationally recognized faculty members as well as our distinguished alumni.

On the occasion of our 50th convocation I present this book highlighting our achievements and contributions in addition to giving an insight into what we are currently engaged in. I take this opportunity to acknowledge the contributions of Professor Partha Pratim Majumder, Professor Pradipta Bandyopadhyay, Shri Narendra Ranjan Mukerje, and my colleagues in the Reprography and Photography Unit particularly Shri Tapas Basu, for conceptualizing and designing the book within a short span of time.

Sanghamitra Bandyopadhyay

Sanghamitra Bandyopadhyay
Director
Indian Statistical Institute

Kolkata
January 15, 2016



The ISI Mission

1. To promote the study and dissemination of knowledge of Statistics, to develop statistical theory and methods, and their use in research and practical applications generally, with special reference to problems of planning of national development and social welfare.
2. To undertake research in various fields of natural and social sciences, with a view to the mutual development of Statistics and these sciences.
3. To provide for, and undertake, the collection of information, investigation, projects and operational research for purposes of planning and the improvement of efficiency of management and production.

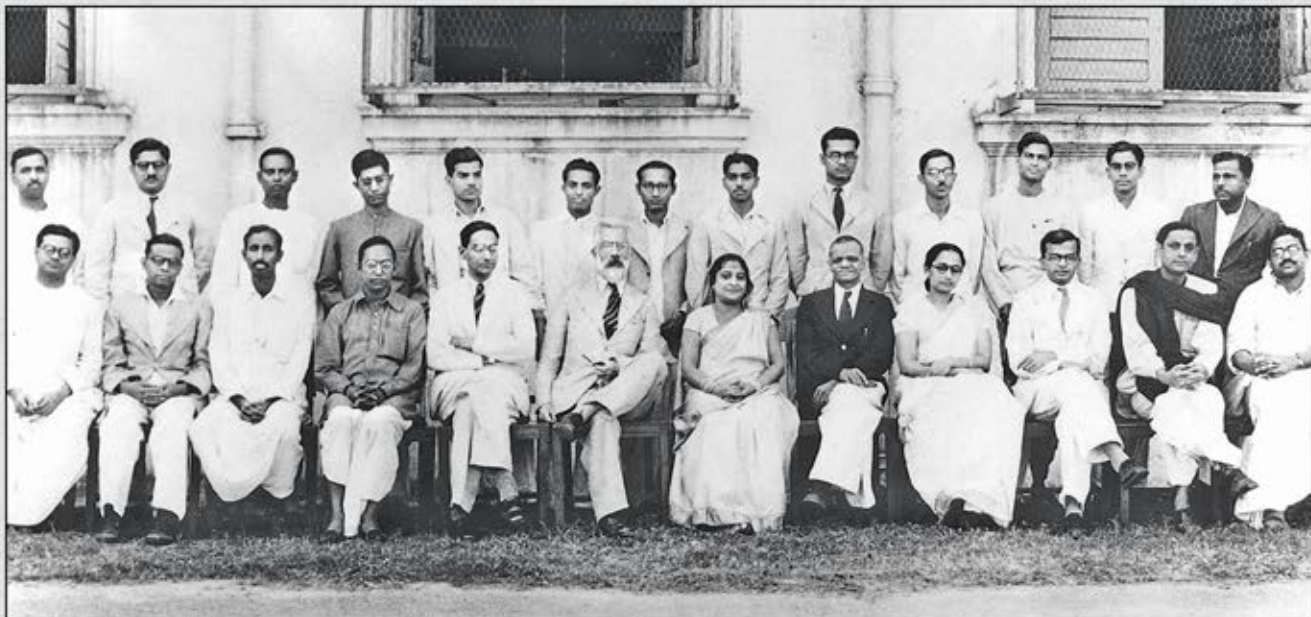
Unity in Diversity is our motto.



We have grown



Prasanta Chandra Mahalanobis set up a Statistical Laboratory in a room in the Presidency College in the 1920s. On 17th December 1931, the Indian Statistical Institute was born. On this day, the Institute was founded as a learned society, which received formal recognition on 28th April 1932. This small laboratory has grown into a vibrant “Institution of National Importance” in India and is now spread over ten cities in the country. We began with an annual budget of Rs. 250; today our budget is over Rs. 2500 million. Our total strength was a single digit when we began; today our family comprises over 250 faculty members supported by an additional 1000+ persons.



R.A. Fisher with the Institute Workers during his visit to I.S.I, on the premises of Presidency College, Calcutta, 1945

L-R (Sitting): Samar Roy, Biren Ghosh, Sudhir Banerjee, R.C. Bose, P.C. Mahalanobis, R.A. Fisher, Nirmal Kumari, K.B. Madhava, Chameli Bose, N.T. Mathew, J.M.Sengupta and P.K.Bose. L-R (Standing): H. Bhattacharya, P.G. Banerjee, J. Sharma, N.C. Mukherjee, N.K. Bhattacharya, R.P. Bhargava, S.Guha, M.N. Ghosh, H.K. Nandi, A, K. Gayen, K.C. Chariyen and D.Guha.



Our contributions that are now legendary

- Mahalanobis D^2 – Measure and test of divergence between groups on the basis of multivariate data.
- Pilot surveys and Interpenetrating Network of Sub-samples – Forerunner of Wald's Sequential Analysis, anticipating it by a decade.
- Fractile Graphical Analysis – Forerunner of non-parametric regression.

"Statistics must have a clearly defined purpose, one aspect of which is scientific advance and the other human welfare and national development"

P.C. Mahalanobis



- Mahalanobis drafted the 2nd Five Year Plan for the nation, which used modern statistical and optimization techniques, that focused on industrial development.

The first Institute of Statistics in the U.S.A. set up by Gertrude Cox in the Research Triangle Park, North Carolina, was modelled after the Indian Statistical Institute.



C. Radhakrishna Rao

"A living legend whose work has influenced not just statistics, but has had far reaching implications for fields as varied as economics, genetics, anthropology, geology, national planning, demography, biometry, and medicine."

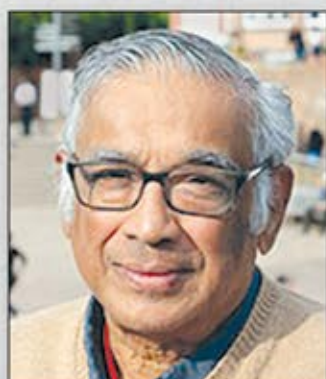
American Statistical Association

- Cramér–Rao bound. • Rao–Blackwell theorem. • Rao–Rubin, Lau–Rao, Lau–Rao–Shanbhag and Kagan–Linnik–Rao theorems on characterization of probability distributions • Orthogonal Arrays

Guy Medal • India Science Award • Srinivasa Ramanujan Medal • U.S. National Medal of Science • Padma Vibhushan • Mahalanobis Centenary Gold Medal • Wilks Memorial Award • Meghnad Saha Medal • JC Bose Medal



The “Famous Four” in ISI



S. R. Srinivasa Varadhan
Padma Bhushan
 U.S. National Medal of Science
 Abel Prize



Veeravalli S. Varadarajan

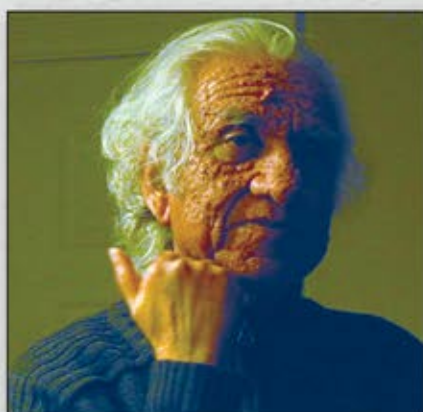


K.R. Parthasarathy

- Kostant–Parthasarathy–Ranga Rao–Varadarajan determinants
- Trombi–Varadarajan theorem
- Enright–Varadarajan modules



R. Ranga Rao



Jayanta Kumar Ghosh

Served as President of the International Statistical Institute.
Padma Shri

- Bahadur–Ghosh–Kiefer representation of sample quantiles.
- Ghosh-Pratt Identity – Connecting two fundamental performance measures in confidence set estimation.

They have done us proud

Neena Gupta

who did her Masters in Mathematics (M. Math.) and Ph.D. from the Institute and now a member of the faculty of the Institute, solved a mathematical problem that was open for almost seven decades; the Zariski Cancellation Conjecture for affine spaces. The Indian National Science Academy (INSA) has recorded Neena's work as "one of the best works in Algebraic Geometry in recent years done anywhere." She has received the INSA Young Scientist medal, inaugural Saraswathi Cowsik Medal by TIFR, and the Ramanujan Prize in 2014.



Amalendu Krishna

The Ramanujan Prize for 2015 was awarded to Amalendu Krishna, who received his M. Stat. and Ph.D. degrees from the Institute, in recognition of his outstanding contributions in the area of algebraic K-theory, algebraic cycles and the theory of motives.



Arunava Sen

is a Professor in the Economics and Planning Unit of the Institute's Delhi Centre. He has made seminal contributions to the theory of mechanism design. His research recognizes that information pertinent to economic policy design is held by individuals who may benefit by misrepresenting it, and that policy

implementation is constrained by the freedom of individuals to act. Sen has shown that any social choice rule can be approximated by one that is a Nash equilibrium of such individual interaction. Land acquisition, which is a problem in India and elsewhere, is required for establishment of Special Economic Zones or for setting up of industries. Sen has discussed the potential application of mechanism design theory to address this problem. He has shown how the requirement of voluntary participation, efficiency and incentive compatibility may be difficult or impossible to achieve simultaneously. He has raised the possibilities for 'second-best' alternatives and the role of government in setting the rules to implement these possibilities. For his outstanding work, he has been awarded the Infosys Prize in Social Sciences – Economics, 2012.



We continue to make significant contributions to diverse branches of science

Counterfeit Currency in India

Counterfeit currency is a serious security hazard. Estimating the quantum of counterfeit currency notes in circulation is required for effective policy decisions. Estimation is difficult as fake currency detected is often not reported to the police. Past efforts to estimate the volume have not been very successful. Using innovative statistical methods, statisticians of the Institute in collaboration with relevant Ministries of the Government have provided reliable estimates, based on which various policy decisions are being implemented.

Swachh Bharat abhiyan

To fulfil Mahatma Gandhi's dream, the Prime Minister has launched the Clean India mission. However, a quantitative index of cleanliness is unavailable. Unless such an index is developed and its change monitored over time, it will not be possible to objectively assess whether our nation is becoming cleaner. The Institute has joined hands with the Government of Tamilnadu and has undertaken a pilot project to develop a Cleanliness Index based on statistical considerations and to study its applicability in monitoring change in cleanliness.

Random Matrices and Extreme Values

The study of random matrices has gained importance in recent times, especially because high-dimensional data are increasingly being collected in many areas of science. Standard statistical methods become inapplicable when we have large-dimensional models. Testing for white noise in high-dimensional time-series data cannot be done using standard methods. Capturing the probabilistic behaviour of the sample cross-covariance matrices holds the answer. This is done by studying the property of random matrices via the so called free probability – a new probability method for non-commutative objects. Many significant results have been obtained by probabilists of the Institute in recent times, which have received international acclaim.

Gaussian free field is a central object in modelling random surfaces (random interfaces) in statistical mechanics. Connections to study of branching random walk, number theory and random matrices have been established. Some faculty members of the Institute have recently developed the theory for understanding the extremes of such fields and various fractal properties.



Pioneering Synergistic Integration of Multiple Concepts to Improve Computation

With large and complex data sets, it is critical to make computation more efficient so that inference can be drawn from the data in a short time. The need for this efficiency has spawned new computation techniques, many of which mimic the central ways in which information is processed in natural systems. Computer scientists of the Institute have pioneered research in such techniques like fuzzy sets, artificial neural networks and evolutionary computing. Fuzzy sets were introduced in 1865 by Lotfi Zadeh (who delivered the 40th Convocation Address of the Institute). As opposed to classical set theory in which an element either belongs to or does not belong to a set, fuzzy set theory permits the gradual assessment of the membership of elements in a set with the aid of a membership function that takes values in the real unit interval $[0,1]$. A family of generic models synergistically integrating such natural computing techniques, most visible being the fuzzy neural networks, have been developed in the Institute particularly for feature selection, classification and clustering. These and other statistical methods have greatly enhanced the speed of computation and hence of decision making in different domains. Applications in biological information processing is of special significance where the work of the scientists of the Institute have led to the identification of new biomarkers in different cancers, novel tools for making predictions and models for cellular components. The scientists have also made fundamental contributions in medical, satellite and document image processing with large-scale applications in industry.

Square Kilometre Array

The international effort to build the world's largest radio telescope is called the Square Kilometre Array (SKA) project. This telescope will have extraordinary sensitivity even to detect a signal from a planet tens of light years away with an unprecedented accuracy. Jointly with nine other countries, India is a member of the international consortium to design the SKA. Our Institute has been selected as a Regular Member Institute of SKA-India Consortium (SKAIC) that will enable us work on various aspects of the SKA from the inception of the project.



Resurrection of Mahalanobis's Fractile Graphical Analysis

In 1960, Mahalanobis published a paper in *Econometrica* titled "A method for fractile graphical analysis." In his own words, this provided "a new method for the comparison of economic data relating to the same population over time or to any two populations that differ as to geographical region or in any other way." Fractile graphical analysis was largely forgotten.

Recently, a group of statisticians of the Theoretical Statistics and Mathematics Division of the Institute has resurrected the method and has extended it in many directions. One new direction has been to use fractile transformation to standardize covariates to make regression functions become comparable. For example, it is known that body dimensions are associated with blood pressure. To compare the relationship of blood pressure with body dimensions in two populations, appropriate adjustments for differences in variability of body dimensions in the two populations need to be made. Standard methods of adjustment often do not work well, but it has been shown that fractile transformation of body dimensions provides a satisfactory solution.

Expanding Mahalanobis-Rao's Work on Human Diversity in the Genomic Era

The anthropometric surveys undertaken among population groups of the United Provinces and Bengal were landmarks for both anthropological and statistical sciences in India. The analyses of these data resulted in the development of some major multivariate statistical methods, such as novel cluster analysis methods. The inferences made by application of standard and novel statistical methods showed that geographical proximity of habitat, rather than social proximity, was a stronger correlate of anthropometric affinity among population groups in India. When these studies were expanded to include ABO blood group

Ancestral North Indian (ANI) Ancestral South Indian (ASI) Ancestral Austro-Asiatic (AAA) Ancestral Tibeto-Burman (ATB) Ancestry Andaman & Nicobar

The Institute has continued to support studies on human diversity and affinities and expand these to provide insights into the peopling of the Indian subcontinent. Recent genome-wide studies have provided evidence of four ancestral components among the people of India and a distinct fifth component among some tribal groups of the Andaman and Nicobar archipelago.

Admixture among populations during historical times may have contributed to the lack of strong congruence of genomic and geographical or sociocultural affinities.

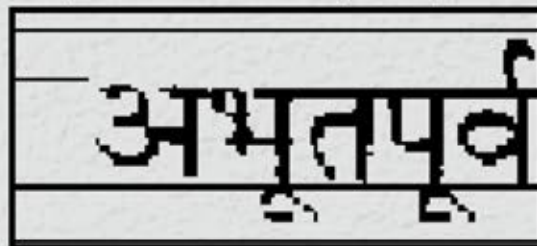


Cryptography Research

Increasingly, there is transfer of confidential information along public-domain highways, including electronic highways. Confidential information need to be transmitted in a secure manner. For purposes of security, the information needs to be encoded so that it is not easy to decipher. Even bank account details on an ATM card need to be encoded. The invention of techniques for secure communication – cryptology – involves complex inter-disciplinary knowledge and research cutting across disciplines of mathematics, probability, statistics, computer science and engineering. A group of scientists of the Institute have conducted important research on cryptology, the results of which are being used by the Defence Research and Development Organization, Indian Navy, Indian Space Research Organization. This group is now internationally renowned for their deep contributions to this expanding area of science.

Optical Character Recognition

Recognizing digitized images of written or printed material and converting them into an editable form is extremely useful, but is not an easy task. This requires optical character recognition (OCR). OCR is a field of research in pattern recognition, artificial intelligence and computer vision. Scientists of our Computer Vision and Pattern Recognition Unit have been deeply involved in OCR research. OCR of handwritten text in various Indian languages, including Bangla and Hindi has been developed. Automatic, computerised spell-checkers are also

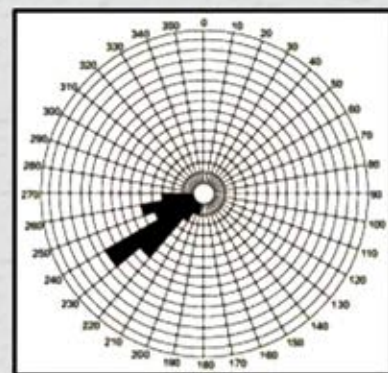


being developed. Work on developing a tri-lingual computer dictionary (Hindi, Bangla, English) is in full swing. A talking dictionary and talking editor for Bangla text, and a computer based Bangla speech synthesizer have been developed by our scientists.



Paleocurrents and Statistical Analyses of Directional Data

Geologists of the Institute have engaged themselves in understanding the formation of the earth. Ancient rivers have left tell-tale signs of their directions of flow on rock deposits. These are in the form of ripple marks and/or arrangement of pebbles and sand grains sorted by size during sediment transportation. Since the rivers are now extinct, the problem is to infer the



directions of their flow from the signs they have left on the rocks. These inferences need to be statistical. It is well known that conventional methods of statistical analysis are not applicable to directional data (e.g., crossbedding and ripple-mark directions, grain lineations, etc.) which are "circularly distributed" on a compass dial. Geologists of the Institute have worked jointly with statisticians to develop a suite of statistical methods for analysis of directional data. Refinements and new developments are being actively pursued by statisticians of the Applied Statistics Unit of our Institute.

Social Network Analysis

The social structure of a population is determined by the nature and extent of social interactions among individuals in the population. The network of social interactions needs to be statistically analyzed in order to derive sociological characteristics of the population. Further, social networks of two populations need to be objectively compared to infer whether there are intrinsic differences in the sociological characteristics of the populations.



Social network analysts have developed a number of tools for conceptualizing and indexing the variations in the kinds of structures that characterize populations. Social scientists and statisticians of the Institute have collaboratively derived measures of social phenomena (such as, reciprocity) in a social network. Based on empirical data collected by the sociologists of the Institute, statisticians of the Institute have shown that many standard deterministic models and probabilistic measures have severe limitations. These collaborations have resulted in many useful graph-theoretic methods for objectively extracting properties of social networks and for comparing sociological characteristics of populations. Some of these methods are now being explored for possible application to genomic data.

Dinosaur Research

Research carried out during the last four decades has shown the scientific potential, significance and uniqueness of the Indian record of dinosaurs in a global context. Geologists of the Institute, through their unique discoveries, have played a leading role in providing keys to questions regarding dinosaur origins, their rise to gigantism, nesting behaviour, dietary preferences and the contiguity of land masses in the past.





One of the most completely known sauropod dinosaurs from the early Jurassic (199.6-175.6 million years ago) is *Barapasaurus* (big-footlizard). The only species is *B. tagorei* (in honour of Rabindranath Tagore). Scientists of the Geological Studies Unit of the institute have discovered several fossils of *Barapasaurus* from a single locality in the vicinity of the village of Pochampalli, in Nalgonda District, Telangana. Recently, the phylogenetic position of this genus within the Sauropoda has been clarified. Another genus of sauropods that lived during 145 and 66 million years ago, discovered by our geologists, has been named *Isisaurus* (after ISI). The type specimen has been named *Isisaurus colberti* (honouring Edwin Colbert), and was found in Maharashtra.

Agni and Us

January 31, 2015, marked a historic day in India's nuclear deterrence, with the successful testing of the longest range ballistic missile Agni-V. Agni missiles are developed and made by the DRDO, Defence Research and Development Organization, for the use of the Indian Armed Forces. Agni missiles critically depend on the flawless performance of sophisticated software systems on-board and off-board. The Software Quality and Assurance Division (SQAD), Advanced Systems Lab, DRDO Hyderabad has set up a collaboration with the verification and validation group at the Advanced Computing and Microelectronics Unit of our Institute, for the design and application of a formal verification framework for the Agni missile software.

(Photo courtesy: <http://i.ndtvimg.com>)





Research on Nano-Electronics and Biochips

Scientists of the Institute have collaborated with those in IIT Kharagpur, IEST Shibpur, Jadavpur University, NIT Durgapur, Duke University (USA), University of Bremen (Germany), Tsinghua University (China), NTU, NTHU, and NCTU (Taiwan), Kyushu Institute of Technology - Iizuka and Meiji University (Japan) to set up the Nanotechnology Research Triangle in 2012 to conduct high-end research program in various emerging areas of nano-electronics and microfluidic biochips. While the research on nano-electronics will impact future generations of computer design, advances in micro/nanofluidics will help automate biochemistry on a tiny lab-on-a-chip for the purpose of DNA analysis, toxicity and environmental studies, pathological tests, point-of-care medical diagnosis, and for drug delivery and drug discovery.

The structured organization of our scientific activities

The activities described above are a small sample of the plethora of scientific activities we are engaged in and the contributions we have made to various domains of science. Our scientific activities are organized in a set of separate, but inter-connected, divisions.

These Divisions are (<http://www.isical.ac.in/departments.php>):

- Theoretical Statistics and Mathematics Division
- Applied Statistics Division
- Statistical Quality Control and Operations Research Division
- Computer and Communication Sciences Division
- Biological Sciences Division
- Physics and Earth Sciences Division
- Social Sciences Division
- Library, Documentation and Information Sciences Division



We were the first in India

The first analog computer in India was designed and built by our scientists in 1953, for use in computation of numerical solutions of simultaneous linear equations using a modified version of Gauss-Siedel iteration. In 1955, the first digital computer of India (HEC-2M manufactured by British Tabulating Machine Company) was procured by us. Even while the HEC-2M and another Russian compute (URAL-1) were operational, our electronics engineers began to develop the first second-generation digital computer of India in collaboration with Jadavpur University (JU) and produced the transistor-driven machine ISIJU-1, which became operational in forefront of digital computing in India for many decades and our computer scientists have done us proud by winning many national and international prizes and awards.



Niels Bohr on the URAL-1 Computer Floor

Sankhya



The Indian Journal of Statistics, Sankhya, which we have been publishing since it was started by Prasanta Chandra Mahalanobis in 1933, has always been regarded as a premier journal of statistics. In the first editorial, Mahalanobis wrote "A research journal serves that narrow borderland which separates the known from the unknown, and it is not always possible to see clearly the lines of future developments. We shall, therefore, invite papers of all kinds appraising them only on the basis of observational accuracy and logical reasoning. We shall publish carefully collected statistical materials irrespective of the subject even if they have not received any analytic treatment. We shall pay special attention to developments of the mathematical theory of statistics..."

We continue to steadfastly adhere to this philosophy.



We have diversified our courses and have made our training more relevant

The flagship undergraduate programme of our Institute started in 1960. The polymath and one of the founding fathers of population genetics, J.B.S. Haldane, who renounced his British citizenship and had joined our Institute, was the chief architect of the undergraduate programme in ISI. "... the integrated teaching programme which we have could not have been put through, I'm almost certain, without his very massive support," said Prasanta Chandra Mahalanobis.



J.B.S Haldane inaugurating the undergraduate degree programme on August 17, 1960.

Today many Indian institutions boast of integrated teaching programmes, but ISI was the first institution in India to have implemented such a programme; thanks to the ideas and efforts of J.B.S. Haldane and P.C. Mahalanobis. We have since initiated many more courses in keeping with the demands and our perceptions of the changing times.

A listing of courses currently offered by us is provided below.

	PROGRAMME	Year of Inception	DURATION	VENUE FOR 2015-16
Degree Programmes	Bachelor of Statistics (Hons)	1960	3 years	Kolkata
	Bachelor of Mathematics (Hons)	2000	3 years	Bengaluru
	Master of Statistics	1960	2 years	Delhi & Chennai
	Master of Mathematics	2003	2 years	Bengaluru
	Master of Science (Quantitative Economics)	1996	2 years	Kolkata and Delhi
	Master of Science (Library and Information Science)	2008	2 years	Bengaluru
	Master of Science (Quality Management Science)	2014	2 years	Bengaluru - Hyderabad
	Master of Technology (Computer Science)	1981	2 years	Kolkata
	Master of Technology (Quality, Reliability & Operations Research)	1989	2 years	Kolkata
Diploma/ Certificate	Part-time Course in SQC	2013	6 months	Bengaluru Hyderabad
	Postgraduate Diploma in Statistical Methods and Analytics	2014	1 year	Tezpur
	Postgraduate Diploma in Computer Applications	2015	1 year	Giridih
Fellowship	Junior/Senior Research Fellowship		6 years	Kolkata
				Delhi
				Chennai
				Bengaluru
				Hyderabad

Our new inter-disciplinary course

Business Analytics refers to the analysis of data using statistical, machine learning and quantitative techniques with the purpose of understanding past performance of the business and generating new insights for the future. Recent forecasts indicate that global spending on business analytics services is expected to double in the next 5 years from its present volume of about US\$ 40 billion. Predictions also are that there will be a huge deficit of capacity to provide these services. In recognition of these predictions, we have started a two-year Post Graduate Diploma in Business Analytics (PGDBA), jointly with the Indian Institute of Management Calcutta and Indian Institute of Technology Kharagpur.



International Statistical Education Centre

The Institute runs the International Statistical Education Centre (ISEC), established in 1950, under the auspices of the Government of India. Through this Centre we provide training in Statistics to students primarily from the Middle-East, South and South-East Asia, the Far-East and from the Commonwealth countries of Africa.



The Dean-of-Studies, Professor Pradipta Bandyopadhyay, handing over the diploma on successful completion of the course to an ISEC trainee



Our convocations

Students who successfully complete our courses are awarded degrees, diplomas and certificates in a special event, the Annual Convocation. One major attraction of the Annual Convocation is the presence of a luminary who delivers the convocation address as the guest-of-honour. As Professor C.R. Rao has stated in his 21st convocation address delivered on 5th March 1987, "It has been customary with the ISI to invite only scientists to deliver the convocation address." Over the years, the thoughtful addresses have provided encouragement not only to the graduating students, but also to all members of our Institute. Thoughts contained in some of these addresses have served as our guiding lights as well.



P. C. Mahalanobis addressing the first Convocation on 12th February 1962

Excerpts from our convocation addresses

***First Convocation (12th February 1962) – Convocation Address titled
"Statistics: A New Technology of Modern Age" by Sir Ronald A Fisher***

"Every time I see the Institute it is bigger and I hope better... It certainly shows no sign of narrowness or standardization. New facets are always appearing – a palaeontological museum or a garden of Indian cultivated plants. I take these bold excursions to mean that the Director believes, as I most certainly do myself,

“It is not enough to have a large number of scientists in research institutes publishing many papers most of which may be useless and therefore called pure research, but which have no connection with economic growth. ... Therefore, today, I should like to say to our young graduates and to my colleagues, our teachers and our students, and also to our guests from neighbouring countries which are underdeveloped, that you must realise that the essential need is the most difficult transition of lifting our country into the modern age by establishing a sound and growing tradition of science. This is the task which is before us, nothing less would be enough.”

*Ninth Convocation (20th December 1974) – Convocation Address titled
“Problems of Young People Preparing for Research Work in Statistics” by Jerzy Neyman*

“The process of questioning and then testing an accepted theory, and then of producing a more satisfactory one is what I call “innovative” work in science. In order to be able to do such work, the applied statistician must have a mastery of the relevant mathematical discipline Also, the applied statistician must have scholarly initiative and talent. ISI ... offers you opportunities for contacts with applied research that are not paralleled in any other institution that I know of. So, be alert, appreciative of the institution you are in, study “your own problems” and interesting novel mathematical disciplines, and enjoy life!”



*Eleventh Convocation (17th February 1977) – Convocation Address titled
“Statistics: A New Foundation and Methodology” by Harald Cramer*

“We all know that in the course of the development of statistical methodology there have been strong differences of opinion, and that many questions are still controversial and are being answered in different ways by different groups of statisticians. I believe that it is highly important that differences of opinion should be freely discussed, and that the occurrence of such discussions is a sign of health and can only further the progress of science.”



Harald Cramer delivering the Convocation Address at the Eleventh Convocation.
L to R: G. Kallianpur, Subimal Dutt, C.R. Rao

*Twenty-first Convocation (5th March 1987) – Convocation Address titled
“Uncertainty, Randomness and Creativity” by C.R. Rao*

“Quantification of uncertainty is perhaps the greatest invention of the twentieth century which led to wise decision-making under uncertainty and improved quality of life for mankind.”



Twenty-fourth Convocation (29th December 1989) – Convocation Address titled “Taming of Uncertainty” by C.R. Rao

“Decision-making under uncertainty is the subject matter of statistics. The technical problems involved in this process are not always simple, and new methodologies have to be constantly developed to refine earlier methods and to meet the demands of new situations. The need for statistical expertise is bound to grow, and so will be the need for statisticians.”



Thirty-eighth Convocation (27th January 2004) – Convocation Address titled “Statistics and its Multi-Dimensions” by A.P.J. Abdul Kalam

“Solving problems through statistical modeling requires a large number of young brilliant minds to take up research in statistics and make it a profession and a way of living. For this to happen, the faculty members have an important role to play; they not only must encourage the identified talents in the students, but also be able to spot the brilliant Ramanujans in the nascent stage itself, much before any one else in the world spots them. And these could be from unknown corners of the country and at times a diamond waiting to be cut and made into a jewel.”





*Forty-third Convocation (24th March 2009) – Convocation Address titled
“The Brain and Mind” by Mriganka Sur*

“... the goal in our field, as of all science and technology, must be to improve the human condition and be a force for social justice. Too often, the fruits of scientific research seem too obscure to common people or even antithetical to their interests. The capacity of the human mind to change is itself a potent force that requires vigilance, for it can be used for good or for evil.”



M.G.K. Menon felicitating Mriganka Sur.

Forty-sixth Convocation (12th January 2012) – Convocation Address by Joseph E. Stiglitz

“There is no clear roadmap for where India is going today. Fifty years from now, does it see itself much as it is today – a divided country, only with the rich much richer, the poor perhaps a little better than they are today? Does it see itself evolving like the U.S., where even the middle has not been sharing the gains of the growth? Where the rich live in gated communities, waited upon by the vast majority of the poor, who earn in a lifetime but a fraction of what they receive in an hour?”





We now have a pan-India presence

We are headquartered in Kolkata and have four centres operating at Delhi, Bengaluru, Chennai and Tezpur. In addition, we have a branch at Giridih and also a network of units at Coimbatore, Hyderabad, Mumbai and Pune, involved in activities related to Statistical Quality Control and Operations Research.

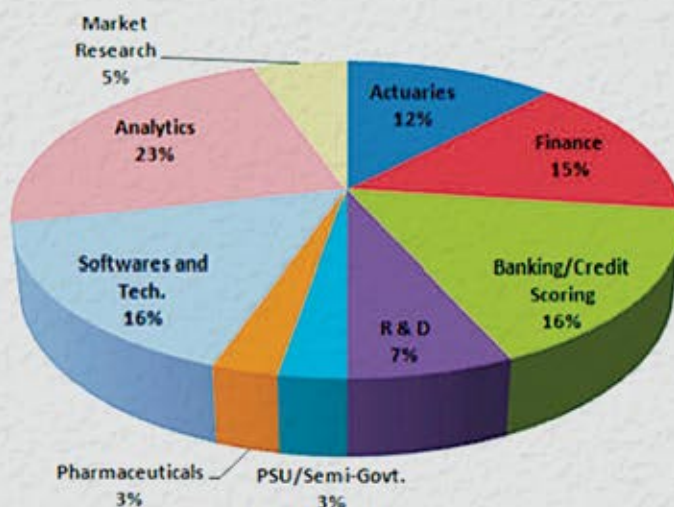


Smt. Indira Gandhi, Prime Minister of India, inaugurating the Delhi campus of our Institute, with P. N. Haksar, Chairman of our Council, and C. R. Rao, our Director, on 31st December 1974



Our alumni serve far and wide

A sizeable fraction of our graduating students have been remarkably successful in research and teaching. They also serve the industry and the service sector. With increases in ease and volume of data acquisition, various sectors of the economy are increasingly making data-informed decisions. This decision-making process requires high-level skills in data management, computing and statistical science. The Institute has trained their students well so that they are able to face challenging and demanding jobs. The alumni of the Institute work in a large diversity of domains and geographies. They are spread far and wide. Many of our alumni occupy high positions in the academia in various universities throughout the world. Some have gone on to occupy prestigious positions; for example, alumnus Sastry G. Pantula has served as the President of the American Statistical Association and the Director of the Division of Mathematical Sciences of the U.S. National Science Foundation. Some alumni have gone on to establish successful global businesses; for example, alumnus Atul Jain founded a company in 1995 which is now a leading provider of planning, assurance, analytics and optimization solutions to communications service providers worldwide. Our alumni have successfully served global companies that include Google, IBM, Hewlett-Packard, Microsoft, Amazon, TCS, Wipro, BNP Paribas, Credit Suisse, Goldman Sachs, JP Morgan, Morgan Stanley, American Express, Axis Bank, HDFC Bank, Citigroup, ICICI Lombard, Novartis, Dr. Reddy's, Ford, Xerox Research, Infosys Labs, etc.





... and, they continue to do us proud

The Jan Tinbergen Awards, named after the famous Dutch econometrician, are biannual awards given by the International Statistical Institute to young statisticians from developing countries for best papers on any topic within the broad field of statistics. The Tinbergen Award (2nd Prize) for 2015 was given to our alumnus Mr. Arun Kumar Kuchibhotla for his paper 'Testing in Additive and Projection Pursuit Models'.



In 2013, our alumnus Mr. Abhik Ghosh had won 1st Prize - Tinbergen Award.

Many former students of our Institute have demonstrated extraordinary scholarship and hold faculty positions in renowned global universities.

Integration



INTEGRATION, the annual techno-cultural fest organized largely by our students, began as an in-house students' cultural festival but has now gained popularity among students throughout the country.



Our direction-setters



P C Mahalanobis



C R Rao



Gopinath Kallianpur



B P Adhikari



Ashok Maitra



Jayanta Kumar Ghosh



B L S Prakasa Rao



S B Rao



K B Sinha



Sankar K Pal



Bimal K Roy



Sanghamitra Bandyopadhyay

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Published by Public Relations Unit, ISI
Photo & Design by Repro and Photo Unit, Library, ISI Kolkata