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**PADMA BHUSHAN AND PADMA VIBHUSHAN PROFESSOR C. R. RAO
(CALYAMPUDI RADHAKRISHNA RAO), *FRS*:
A LEGEDARY STATISTICIAN AND MATHEMATICIAN
R. C. Singh Chandel**

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On behalf of VIJÑĀNA PARISHAD OF INDIA and *JÑĀNĀBHA* Family, we feel great proud to publish
special Issue of *JÑĀNĀBHA* Vol. 56(1) (2026)

*Dedicated to the Memory and Honour of Padma Bhushan and Padma Vibhushan
Late Professor C. R. Rao (September 10, 1920 - August 22, 2023)*

Professor C. R. Rao was a world-renowned statistician and mathematician whose pioneering contributions to statistical theory and multivariate analysis have left an indelible mark on science, mathematics, economics, medicine and engineering across the globe. He is widely regarded as one of the foremost mathematical scientists of the twentieth century. His theoretical discoveries, made over a career spanning more than seven decades, have become indispensable components of the graduate and postgraduate curricula in statistics, econometrics, electrical engineering and allied disciplines at universities worldwide.

As a man, Professor C. R. Rao was a great human being, an exemplary teacher, an eminent researcher, a visionary institution-builder and a perfectionist in every sense of the word.

Professor C. R. Rao: A Bibliographic Sketch

Professor C. R. Rao was the 8th of the ten children born on September 10, 1920, at Hoovina Hadagali, Bellary District, Karnataka State. His father, C. Daraiswamy Naidu, served as an Inspector of Police. Professor Rao completed his schooling at various institutions across Andhra Pradesh including Gudur, Nuzvid, Nandigram, and Visakhapatnam. He received his M.A. degree in Mathematics with First Class and First Rank from Andhra University in 1941, and thereafter his M.A. degree in Statistics with First Class, First Rank and a Gold Medal from Calcutta University in 1943 - a record of marks that remained unbeaten for many years. He pursued doctoral research at King's College, Cambridge University, under the supervision of Professor Ronald A. Fisher, widely regarded as the father of modern statistics, and was awarded the Ph.D. degree in 1948 for his thesis entitled Statistical Problems of Biological Classification. In 1965, Cambridge University conferred upon him the higher degree of D.Sc. based on his outstanding publications in statistics.

Citizenship:

Indian (until 1995),

American (1995-2023).

Professor C. R. Rao held the following distinguished academic and administrative posts:

- Director, Indian Statistical Institute, Kolkata
- Jawaharlal Nehru Professor and National Professor, India
- University Professor, University of Pittsburgh, U.S.A.
- Eberly Professor and Chair of Statistics, Pennsylvania State University, U.S.A.
- Director, Center for Multivariate Analysis, Pennsylvania State University, U.S.A.
- Research Professor, University at Buffalo, U.S.A.

As Head and later Director of the Research and Training School at the Indian Statistical Institute for a period of over 40 years, Professor Rao developed internationally acclaimed research and training programmes and produced several leaders in the fields of mathematics and statistics. In addition to a teaching and research

experience of more than 60 years, Professor Rao was on the frontline of mathematical statisticians and data scientists in India and abroad.

Research Experience: more than 75 years

- Guided numerous candidates for Ph.D. degrees in Statistics and Mathematics
- Published approximately 500 research papers in reputed national and international journals
- Author of 15 textbooks and editor of numerous special volumes in probability and statistics
- His 1965 text Linear Statistical Inference and Its Applications has received more than 19,000 citations and is one of the most cited books in the whole of science
- Conducted and guided research projects of national and international importance

Professor C. R. Rao popularized multivariate statistical methods and their applications in the physical, biological and social sciences by delivering plenary lectures and keynote addresses at hundreds of National and International Conferences, Seminars and Symposia. His scientific contributions in the following areas are especially worth noting:

- Derivation of the Cramr-Rao Lower Bound, establishing the fundamental limit on the variance of any unbiased statistical estimator
- Formulation of the Rao-Blackwell Theorem, a cornerstone of estimation theory taught in undergraduate and postgraduate curricula worldwide
- Development of Information Geometry, connecting statistical theory with differential geometry
- Foundations of multivariate analysis of variance (MANOVA) and discriminant analysis
- Development of generalized inverses of singular matrices and their statistical applications
- Characterization of probability distributions and asymptotic theory
- Applications of statistical methodology to economic planning, weather prediction, medical diagnosis, genetics, anthropology, demography and engineering

Areas of Research Contributions

- Estimation Theory
- Statistical Inference and Linear Models
- Multivariate Analysis
- Combinatorial Design
- Orthogonal Arrays
- Statistical Genetics
- Generalized Matrix Inverses
- Functional Equations
- Biometry

Life Member / Fellow of the Following Societies and Academies

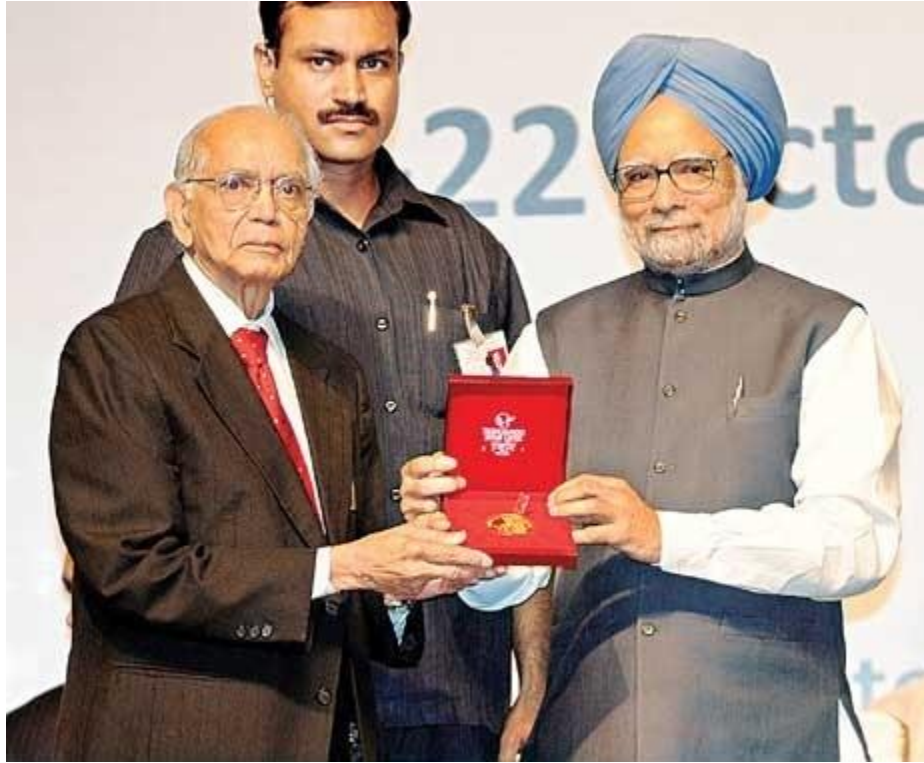
- Fellow, Royal Society, United Kingdom
- Fellow, U.S. National Academy of Sciences
- Fellow, American Academy of Arts and Sciences
- National Academy of Sciences, India
- Indian Statistical Institute
- International Statistical Institute (Former President, 1977-1979)
- Institute of Mathematical Statistics (Former President, 1976-1977)
- International Biometric Society (Former President, 1973-1975)
- He served on the Editorial Boards of various national and international journals and as a reviewer of research papers and projects for scientific bodies worldwide.
- Professor Rao visited numerous countries as Visiting Faculty and delivered invited, plenary and keynote lectures in the U.S.A., United Kingdom, Germany, Canada, Australia, Japan, Italy, France, and many other nations.
- On the recommendation of Professor Rao, the Asian Statistical Institute (now known as the Statistical Institute for Asia and Pacific) was established in Tokyo to provide training to statisticians in government and industry.
- He was Chairman of a United Nations Committee on statistical personnel needs in Asian countries.



Professor C.R. Rao receiving the Padma Vibhushan Award from President K.R. Narayanan, 2001. Image credit: B.L.S. Prakasa Rao



Professor C.R. Rao receiving the National Medal of Science from President Bush, 2002. Image credit: Wikimedia Commons/NSF.



Professor C.R. Rao receiving the India Science Award from Prime Minister Manmohan Singh, 2010. Image credit: B.L.S. Prakasa Rao.

Honours and Awards

- Shanti Swarup Bhatnagar Award for Science and Technology (1963)
- Padma Bhushan (1968) and Padma Vibhushan (2001), Government of India
- International Mahalanobis Prize (2003), International Statistical Institute
- Srinivasa Ramanujan Medal (2003), Indian National Science Academy
- United States National Medal of Science (2002) - presented by President George W. Bush, the highest scientific honour in the United States
- India Science Award (2010) - the highest honour conferred by the Government of India in a scientific domain
- Guy Medal in Gold (2011), Royal Statistical Society, United Kingdom - the highest award given to a statistician in the United Kingdom
- International Prize in Statistics (2023) - widely regarded as the Nobel Prize equivalent in the field of statistics
- Recipient of 40 honorary doctoral degrees from universities across 19 countries in six continents

In Honour of Professor Rao

- The Pennsylvania State University has established C. R. and Bhargavi Rao Prize in Statistics
- C. R. Rao Advanced Institute of Mathematics, Statistics and Computer Science
- National Award in Statistics established by Ministry of Statistics and Programme Implementation (MoSPI), Government of India
- The road from IIIT Hyderabad passing along Central University of Hyderabad crossroads to Alind Factory, Lingampally is named "Prof. C.R. Rao Road"

In 1988, the Times of India identified Professor Rao as one of the top 10 modern scientists of Indian origin, alongside mathematician S. Ramanujan and Nobel Laureates S. Chandrasekar, H. Khorana and C. V. Raman. In the Chronology of Probabilists and Statisticians compiled by the University of Southampton, he was listed among the 57 foremost scientists to have made significant contributions to probability and

statistics since the sixteenth century - a list that includes Galileo Galilei, Isaac Newton and Pierre-Simon Laplace.

In addition to his brilliantly distinguished academic career, Professor C. R. Rao was very popular among his students, colleagues, and fellow workers for his cordial support and personal generosity. He was a disciplined, humble, and deeply humane person who believed that the true value of mathematics lay in its capacity to illuminate truth and inspire others. His wife Smt. Bhargavi Rao was his constant companion and source of strength from their marriage in 1948 until her passing in 2017. Professor C. R. Rao passed away on 22 August 2023 in Buffalo, New York, at the age of 102, leaving behind a legacy that shall endure generations to come.