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A News Letter From CR Rao AIMSCS

Volume 1 No. 1

January 2012

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Chairman

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Emeritus and Advisor*

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Awards

The **Guy Medal in Gold** is awarded triennially to those "who are judged to have merited a signal mark of distinction by reason of their innovative contributions to the theory or application of statistics". It can be awarded both to fellows (members) of the Society and to non-fellows.

To date since its inception 120 years ago the Gold Medal was awarded to 34 distinguished statisticians. The first medal was awarded to Charles Booth in 1892. Only two statisticians, H. Cramer (Norwegian) and J. Neyman (Polish) outside Great Britain were awarded the Gold medal. C. R. Rao is the first non-European and non-American to receive the award.

The Guy Medal in Gold was pre-

sented to Calyampudi Radhakrishna Rao (C. R. Rao) on June 29, 2011 by the President of Royal Statistical Society, Valerie Isham, at a function held at the Royal Society, 9 Carlton House Terrace, London, with the citation:

"For his fundamental contributions to statistical theory and methodology, including unbiased estimation, variance reduction by sufficiency, efficiency of estimation, information geometry, as well as the application of matrix theory in linear statistical inference".

C.R.Rao received 34th and 35th Hon Doctorate Degrees

Penn State's **C.R. Rao**, Emeritus Holder of the Eberly Family Chair in Statistics and long recognized as

one of the world's top statisticians, has been honored with the 34th honorary Doctor of Science degree by the University of Colombo in Sri Lanka.

Padma Vibhushan Prof C R Rao was awarded 35th honorary doctorate at the 62nd Convocation of the Karnataka University, Dharwad. Padma Vibhushan Calyampudi Radhakrishna Rao has carried out pioneering research in Statistics and has authored several books in Statistics and Engineering. He initiated research work on "Theoretical Statistics and Probability in India".

Professor Rao has now received 35 Honorary Doctoral Degrees from universities in 19 countries spanning six continents.

Conferences & Workshops Organized (Jan 2011– Jan 2012)

Seminar on "**Approach to 12th Five Year Plan with special reference to Andhra Pradesh**" on 7th June 2011 (jointly with Center for Economic and Social Studies (CESS) and Administrative Staff College of India (ASCI)).

An international workshop on "**Set-Valuations, Signed Graphs and Geometry and Applications**" at Mananthavady from 2nd to 6th September 2011 (jointly with Postgraduate and research Department of Mathematics, Mary Matha Arts and Science College, Mananthavady, Kerala, Department of Science and Technology, Kerala State Council for Science, Technology and Environment).

The first workshop on "**Statistical and Mathematical Modeling including data collection and analysis**" for Woman Scientists of DST (WOSA)-INDIA from 17th to 21st October 2011.

Two Day Workshop on "**Algebraic Cryptanalysis**" from 26th to 27th November 2011.

International conference on "**Applications of Game Theory in Policies and Decisions**" from 12th to 13th December 2011 (jointly with university of Hyderabad, Institute of Public Enterprise and Central University of Rajasthan).

A National Workshop on "**A garden of graphics in Biomedical Research**" from 14th to 15th December 2011. Resource Person: Prof. M B Rao, Professor of Statistical Genetics & Professor of Biomedical Engineering, from University of Cincinnati, USA.

A National Workshop on "**Statistical Genetics**" from 16th to 17th December 2011. Resource Person: Prof. M B Rao, Professor of Statistical Genetics & Professor of Biomedical Engineering, from University of Cincinnati, USA.

Workshop on "**Image and Speech Processing**" on 17th December 2011 (jointly with International Institute of Information Technology, Hyderabad).

A Workshop on "**Computational tools in Bioinformatics**" from 29th to 30th December 2011 (jointly with Jawaharlal Nehru Technological University JNTUK, Kakinada).

Three Day Course on "**Cyber Security**" from 17th to 19th January 2012. Resource Persons: Prof Shambhu Upadhyaya, Sunny Buffalo, Prof M Sethumadhavan, Amrita Vishwa Vidyapeetham, Prof Jayaraj Poroor, Amrita Vishwa Vidyapeetham.

A two day pre conference workshop was conducted from 1st to 2nd January 2012 in which a short course on "Quantitative Methods for Environmental Data Analysis with Statistical Package R". The course was taught by Prof. Marian E. Scott, Professor Adrian Bowman, (University of Glasgow, Scotland), Professor Adrian Bowman (University of Glasgow, Scotland), and Dr Richard Chandler (University College London, UK), leading experts with extensive background in teaching this type of course throughout Europe have organized this workshop on January 1 and 2, 2012 (jointly with university of Hyderabad and International Statistical Institute).

22nd Annual Conference of The International Environmetrics Society (TIES) was organized from 3rd to 6th January 2012 (jointly with university of Hyderabad and International Statistical Institute).

About the Conference TIES 2012

Many developing countries in Asia, Africa, South America, with their increasing populations and decreasing natural resources are facing similar environmental problems. Increasing migration to big cities from villages are causing severe problems in water management, waste management and increasing air pollution in cities. Deforestation, water and air pollution have severe impact on health and, in general, quality of life. These issues and more are the focal subjects for discussion at the 22nd international conference of The International Environmetrics Society (TIES), being conducted during January 3 – 6, 2012. The conference is being jointly organized by the C R Rao Advanced Institute of Mathematics, Statistics and Computer Science (AIMSCS) and University of Hyderabad. This international conference with experts from abroad and India who are scholars in several broad areas of interdisciplinary sciences (from areas such as statistics, health and environment, forestry, remote sensing, etc) are congregating for the first time in India. The aim is one of understanding environmental issues of developed countries and developing countries including India, and offer solutions based on quantitative approaches to modeling and analysis of environmental data. Aptly, the theme of the conference is, **“Environmental Challenges facing developed and developing countries in a Globalized World: Quantitative approaches to Comprehensive Solutions.”** The inauguration ceremony took place on the morning of January 3, 2012 at 9:00 am which has been Presided by Profes-

sor C R Rao, FRS, and the Chief Guest of the function was Professor Ramakrishna Ramaswamy, Vice Chancellor of University of Hyderabad. The Guests of honor were Professor Don Stevens, current President of TIES, Bronwyn Harch, President Elect of TIES, Daniela Cocchi, Past President, Prof S.B Rao, Director CR Rao AIMSCS, Prof. T Subba Rao, and Prof. Venkata Krishna Jandhyala. This is a rare opportunity for all researchers, both established scholars and research students from India to interact with the large number of experts from abroad and establish lasting collaborations with them so that quicker and comprehensive solutions can be developed to some of the pressing environmental challenges of the country.

Prof. Adrian Bowman, University of Glasgow, UK, Prof. Alan E. Gelfand, Duke University, USA, Prof John Haslett, Trinity College, Dublin, Ireland and Prof. Naumova Elena, Tufts University, USA delivered Key note Lectures.

More than 80 participants from abroad are participating in the conference and the countries from which participants have come include USA, Canada, UK, Denmark, Switzerland, Finland, Norway, Sweden, Czeck Republic, Portugal, Australia, Thailand, Germany, Russia, South Africa, and Mexico. There in excess of 130 research papers that are being presented at the conference. These include Four Key-note lectures, nearly 90 invited presentations, 20 contributed presentations, and 20 Poster presentations.

Inauguration of New Building

The inauguration of the **RAMANUJAN** building of the **C R Rao AIMSCS** by the **Honorable Minister of MOSPI Dr MS Gill** and **Honorable Chief Minister of Andhra Pradesh Mr. N.Kiran Kumar Reddy** on **28th of March 2011**. This infrastructure has been sponsored by the **Honorable Prime Minister of India** through MOSPI and ACA under planning commission of India and Government of Andhra Pradesh.

Visitors and Lectures (Jan 2011– Jan 2012)

Prof. J Sreenivasa Rao, University of California, Santa Barbara, CA, USA delivered a talk on “Near matches and applications” on 19th January 2011.

Prof. Suresh Deman, Honorary Director centre for economics and finance, London delivered a talk on “Game of development” on 20th January 2011.

Prof. T Parthasarathy, ISI Chennai delivered a talk on “Mini max theorem and numerical computing” on 29th January 2011.

Prof. Tapan K Sarkar, Syracuse University, Syracuse, New York delivered a talk on “Who is the Father of Electrical Engineering?” on 3rd March 2011.

Prof. A Paulraj, Stanford University delivered a talk on “Wireless access for mobile internet” on 15th April 2011.

Dr. Sunil Kumar Ch, Illinois state university delivered a talk on “A new geodesic proof of a formula of Gauss” on 7th June 2011.

Dr. A S R Srinivasa Rao, ISI Kolkata delivered a talk on “On some accepts of Riemann mapping theorem and its recent association with probability” on 10th June 2011.

Prof. Alladi Sitaram, Indian Institute of Science, Bangalore delivered talks on “A Friendly Introduction to Fourier Analysis” on 21st – 23rd June 2011.

Prof. T E S Raghavan, University of Illinois at Chicago, Chicago delivered talks on “Game Theory” on 12th, 13th and 15th July 2011.

Mr. Sumit Kumar Pandey is delivered a talk on “Explanation of LLL-Algorithm” on 28th August 2011.

Dr. Takashi Nishide, Kyushu University, Japan delivered a talk on “Secure keyword search with Bloom filter” on 13th September 2011.

Dr. Bhaskar Biswas, ISI Kolkata delivered a talk on “Coding theory in Cryptography” on 21st November

2011.

Prof. P Vijay Kumar, IISC delivered a talk on “Explicit code constructions for reliable distributed storage” on 28th November 2011.

Dr. Praveen Gauravaram, ISI, Kolkata delivered a talk on “Application oriented analysis of cryptographic hash functions” on 2nd December 2011.

Dr. Saumyadipta Pyne, Harvard Medical School, USA, delivered a talk on “Bio-medicine at the Single Cell Level” on 12th December 2011.

Dr. Ashok Venkitaraman, Ursula Zoellner Professor of University of Cambridge, Director of Medical Research Cell’s Cancer Cell Unit Center and Joint Director of Hutchison/MRC Research Center, Cambridge Molecular Therapeutics Programme (CMTP) and an elected Fellow of the Academy of Medical Sciences in London as well as the EMBO European Academy delivered a talk on “Genome instability mechanisms in cancer pathogenesis and treatment” on 12th December 2011.

Prof. Magdalena Salazar Palma, University Carlos III, Spain and President of the IEEE Antennas and Propagation Society delivered a lecture on “A Marching-On-in-Degree Method for the Time Domain Analysis of Electromagnetic Structures” on 13th December 2011.

Prof. Tapan K. Sarkar, Syracuse University, USA and Distinguished Lecturer for the IEEE AP Society delivered a lecture on “An Overview of Ultra-Wideband Antennas” on 13th December 2011.

Prof. Shailesh Shirali, Rishi Valley Education Centre delivered a talk on “Capacity building in Mathematics and Numeracy at school level” on 12th January 2012.

Dr. S G Dani, TIFR, Mumbai delivered invited talk on, “Roots, factors and embeddings of probability measures” on 23rd Jan, 2012.

Research Papers Published and Communicated (Jan 2011– Jan 2012)

C R Rao

Published

C R Rao, "Entropy and cross entropy as diversity and distance measures," International Encyclopedia of Statistical Science 2011, Part 5, 440-446, DOI: 10.1007/978-3-642-04898-2_618

Mandala S, Kumara S, **Rao C R**, Albert R, "Clustering social networks using Ant Colony Optimization" Operational Research, 1-19, May 2011

Accepted

Hyunsook Lee, G. Joseph, **C R Rao**, "A jackknife approach to statistical model selection", Journal of Statistical Planning and Inference

S B Rao

Published

S B Rao and K. A. Germina, "Graph Labelings and Complexity Problems: A Review" Proceedings of the workshop on Graph theory and new directions, Narosa Publishing House, New Delhi ISBN 978-81-7319-997-4, pages 1-22, (2011).

Accepted

P S S N V P Rao, B K Sinha, and **S B Rao**, "Some combinatorial Aspects of a Counterfeit Coin Problem," International Journal of Pure and Applied Mathematics

S B Rao, V Parameswaran, and K Balasubramanian, "Characterization of cycle stochastic graphs with applications in Social Networks: Theory, methods and applications," World Scientific Publications (2011).

B D Acharya, S Joshi, and **S B Rao**, "A Ramsey Theorem for strongly connected ambisidigraphs: in Social Networks," World Scientific Publications (2011).

K. Balasubramanian, **S B Rao**, and V. Parameswaran, "Graph Labellings with applications to Social Networks" World Scientific Publications (2011).

Communicated

B D Acharya, V Parameswaran, **S B Rao**, T.K.Singh : Neighbourhood Magic Graphs (Indian Journal of Mathematics)

P S S N V P Rao, **S B Rao**, G.M. Saha, B.K. Sinha: Optimal Designs for Covariates' Models and Mixed Orthogonal Arrays, (Stat. Theory and Practice)

S B Rao, "Strongly connected self – complementary digraphs without Hamiltonian dipaths" (Discrete Mathematics)

V U Reddy

Invited Talks

Plenary Talk on "A General Framework for MIMO Radar," at NIT, Calicut, at the International Conference on Communications and Signal Processing during 10-12 Feb. 2011.

Invited Talk on "Blind Modulation Classification," at GMR Institute of Technology, Rajam, on April 7, 2011 during

their conference inauguration.

Presented

V U Reddy, "Signal Design for a Specified Transmit Beam-pattern, Spatial Ambiguity Function for MIMO Radar: A Brief Review of Recent Results," 2011 IEEE AEMC and IEEE IAW 2011, 18-22 Dec. 2011, Kolkata (invited)

T J Rao

Accepted

T J Rao and **B K Sinha** "A Brief History of Statistics and its Development in the Indian Subcontinent, in Special Volume No.11 of International Journal of Statistical Sciences in memory of Prof. P. C. Mahalanobis.2011

T J Rao, "Statistical Education towards Human Development, In Proceedings of the Diamond Jubilee Conference of the International Statistical Education Centre, Kolkata, Feb. 4-6,2011.

Communicated

T J Rao, "Generalized homogeneous linear estimator and optimality" (Statistical Methodology).

T J Rao, "Vision of Mahalanobis towards Statistics for Development," Paper presented at the Conference to celebrate the World Statistics Day, 20.10.2010 organized by C R Rao AIMSCS and University of Hyderabad.

T S Arthanari

Accepted

T S Arthanari, "Pedigree Polytope Vs. Symmetric Traveling Salesman Polytope – Some new observations," Discrete Applied Mathematics.

T Subba Rao

Published

X Gao, **T Subba Rao**, "Regression models with STARMA errors – An application to the study of temperature variations in the Antarctic Peninsula", Advances in Directional and Linear statistics, ed by Martin T Wells and Ashis Sengupta ,2011, Springer -Verlag,Berlin, ISBN 978-3-7908-2627-2 pages 27-50.

Accepted

T Subba Rao and Gy. Terdik "Statistical Analysis of Spatio-Temporal Models and Their Applications" Handbook of Statistics, Elsevier (ed.T.S.Rao and C.R. Rao)

Gregory Berkolaiko

Communicated

Gregory Berkolaiko and Peter Kuchment, "Dependence of the spectrum of a Quantum of a Quantum Graph on Vertex on Conditions and edge lengths", arXiv:1008.0369v2 [math-ph].

Suhasini Subba Rao**Published**

Yogesh Dwivedi and **Suhasini Subba Rao** "A Test for Second-Order Stationarity of a Time Series Based on the Discrete Fourier Transform", journal of time series analysis, Volume 32, Issue 1, pages 68–91, (2011)

V Ch Venkaiah**Presented**

V Ch Venkaiah and K. Ramanjaneyulu, "Sequentially Perfect 1-Factorization of K_2^n ", presented in 3rd biennial Canadian Discrete and Algorithmic Mathematics Conference (CanDAM) held during 31st May to 3rd June, 2011 at the University of Victoria, Victoria, BC, Canada

V Ch Venkaiah, K. Ramanjaneyulu, **Neelima Jampala**, and J. Rajendra Prasad, Equivalence of lower bounds on the number of perfect pairs, for presentation in the National Conference on Theoretical Computer Science and Discrete Mathematics (NCTCSDM 2012) held at Kalasalingam University during 9th – 11th January 2012.

Poster Presented

V Ch Venkaiah, K. Ramanjaneyulu, **Neelima Jampala** and J Rajendra Prasad "A New near-one-Factorization for complete graphs and its cycle structure analysis", presented in International Workshop on Combinatorial Algorithms (IWCOA 2011) held during 20th to 22nd June, 2011 at the University of Victoria, Victoria, BC, Canada.

V Ch Venkaiah, K. Ramanjaneyulu, **Neelima Jampala** and J Rajendra Prasad "Number of Perfect Pairs: Equivalence of Lower Bounds", presented in International Workshop on Combinatorial Algorithms (IWCOA 2011) held during 20th to 22nd June, 2011 at the University of Victoria, Victoria, BC, Canada.

Invited Talk

Delivered a talk on "History and Applications of Mathematics - An Overview" at DST INSPIRE program on 28th December 2011 in Andhra University, Visakhapatnam.

Sreela Gangopadhyay**Communicated**

Bose, Arup and **Gangopadhyay Sreela**. "Pfeifer records process." (Statistics).

Bose, Arup and **Gangopadhyay Sreela**. "A note on concomitants of records." (Extremes).

P V S Anand**Published**

G V S R. Deekshitulu, J Jagan Mohan, **P V S Anand** "Fractional Difference Inequalities of Volterra Type" International Journal of Pure and Applied Mathematics, 70(2) (2011), 137-149.

Putchu V S Anand, Penugurthi Murali, Kapula R Prasad "Multiple Symmetric Positive Solutions for the System of Higher Order Boundary Value Problems on Time Scales" Electronic Journal of Differential Equations (EJDE), Vol. 2011 (2011), No. 102, pp. 1–12.

P V S Anand "Controllability and Observability of The Ma-

trix Lyapunov Systems" Proceedings of the international conference on Recent Advances in Mathematical Science and Applications (RAMSA) held at Vizag., India (2009), 117-131.(Published in 2011)

Papers Presented

Venkata Sundaranand Putcha and Charyulu L.N. Rompicherla "A Note on Fuzzy Discrete Dynamical Systems" presented on 20-12-2011 in the 56th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM) (An International Meet) held at S.V. National Institute of Technology, Surat, Gujarat from 19th to 21st December 2011.

P Manimaran**Published**

Sayantan Ghosh, **P Manimaran**, and Prasanta K Panigrahi, "Characterizing Multi-Scale Self- Similar Behavior and Non-Statistical Properties of Financial Time Series", Physica A 389 4304 (2011)

Accepted

P Manimaran, and Mayukha Pal, "Dynamics of fluctuations in foreign exchange rate time series through wavelet analysis" (Journal of wavelet theory and applications).

Communicated

P Manimaran, P L Priyanka and **S B Rao** "Candidate gene identification for SLE disease using network centrality measures and Gene Ontology" (Oxford Bioinformatics Journal).

N Anil Kumar**Accepted**

N Anil Kumar and Chakravarthy Bhagavati, "Two Key Signature Scheme with applications to digital certificates" (International conference on Recent Advances in Information Technology (RAIT 2012) Dhanbad.

V Satish**Published**

V Satish, **V Ch Venkaiah**, K Yadav, and K Kothapalli, "Acyclic Vertex Coloring of Graphs of Maximum Degree 5," Discrete Mathematics, Volume 311, Number 5, pp 342-348 (2011).

Sourav Das**Communicated**

Sourav Das, **Tata Subba Rao** and Georgi Boshnakov, "On the estimation of Parameters of Variogram of spatial stationary isotropic random processes". (Environmetrics).

Poster Presented

Sourav Das and **Tata Subba Rao**, "Whittle Likelihood Approach for Covariance Estimation of Spatio-Temporal Processes" in the 22nd Annual Conference of "The International Environmetrics Society (TIES)" held from 3rd to 6th January 2012 in C R Rao AIMSCS, UoH, Hyderabad, India.

G V Deepika**Accepted**

G. V. Deepika, U. Aswani, and R. V. Vardhan, "Multiresolution Time Series Analysis Using Discrete Wavelets," Journal of Wavelet theory and its Applications.

D Venkateswarlu and D V V P R V B Suresh**Communicated**

V V P R V B Suresh Dara, Venkateswarlu Deva, S B Rao and Thomas Zaslavsky, "The Dynamics of the Maximal Forest Operator of a Graph " (Discrete Mathematics).

D J V Sukanya**Papers Presented**

J V Sukanya Divvela and **B K Sinha**, "Price-Weighted Apportionment Index and Related Inference" Accepted for oral presentation in 99th Indian Science Congress Association 2012 held at KIIT University, Bhubaneswar from 3rd to 7th January 2012.

Mridul Nandi**Published**

Donghoon Chang and **Mridul Nandi** and Moti Yung, "On the Security of Hash Functions Employing Block Cipher Post Processing", Lecture Notes in Computer Science, Springer, FSE 2011, LNCS 6733, pp. 146-166, 2011.

M. Prem Laxman Das**Communicated**

Prem Laxman and **Mridul Nandi**, Hashing into elliptic curves via quadratic twists (Information Processing Letters).

Prabal Paul**Accepted**

M N Chintamani, **W D Gao**, **B K Moriya**, **P Paul** and **R**

Books Edited / Editorial Committees:

Pratima Panigrahi and **S B Rao**, "Graph Theory: Research Directions", Proceedings of the workshop on Graph theory and new directions, Narosa Publishing House, New Delhi pages1-160 (2011). ISBN 978-81-7319-997-4.

S B Rao, Editor, AKCE International Journal of Graphs and combinatorics.

B D Acharya, **K A Germina**, **S B Rao** and **Thomas Zaslavsky**, Proceedings of international workshop on "Set-Valuations, Signed Graphs and Geometry and Applications", Mananthavady, 2nd to 6th September 2011, is under finalisation.

Honors

Elected Vice President of CRSI (cryptology research society of India) for 2011-12.

Thangadurai "New upper bounds for the Davenport and for the Erdos-Ginzburg-Ziv constants" Arkiv der Mathematik., Springer.

Mahabir Prasad Jhanwar**Published**

Mahabir Prasad Jhanwar, "A Practical (Non-interactive) Publicly Verifiable Secret Sharing Scheme", The 7th Information Security Practice and Experience Conference - ISPEC 2011, Guangzhou, China, May 30 - June 1, 2011. Proceedings, volume 6672 of Lecture Notes in Computer Science, pages 273-287. Springer Verlag 2011.

Communicated

Mahabir Prasad Jhanwar and **Ayineedi Venkateswarlu**: A Practical (Non-interactive) Publicly Verifiable Paillier Based Secret Sharing Scheme.

Sumit Kumar Pandey, **Mahabir Prasad Jhanwar**, **Santanu Sarkar** and **Rana Barua**: Relaxing IND-CCA: Indistinguishability Against Decisional Chosen Ciphertext Attack.

Presented

May 30-June 1, 2011. Guangzhou, China. Paper entitled "A Practical (Non-interactive) Publicly Verifiable Secret Sharing Scheme" presentation at (Information Security Practice and Experience Conference) ISPEC 2011

Invited Talk

Delivered a talk on "The Learning with Errors Problem (LWE)" At Indo-US workshop on Mathematical and Statistical Aspects of Cryptology organized by ISI Kolkata and Institute for Computational and Experimental Research in Mathematics (ICERM).

Umadevi Ganugula**Accepted**

Pruthvi Sabbu, **Umadevi Ganugula**, **Srinathan Kannan** and **Bruhadeshwar Bezawada**. "An Oblivious Image Retrieval Protocol", The Seventh International Symposium on Frontiers of Information Systems and Network Applications (FINA 2011).

Birth of Children

Venkata Sankalp son of Dr. Ayineedi Venkateswarlu and Mrs. Swapna (20th Septmeber 2010)

Sai son of Mr. Deva Venkateswarlu and Mrs. Mounika (17th May 2011)

Dhruv Ratna Naidu son of Mr. B. Harish Naidu and Mrs. Prathibha (20th June 2011)

Rahul Balaji son of Dr. P Manimaran and Mrs. Ruckmani Devi (19th Septmeber 2011)

Prathibha Lakshmi daughter of Mr. N Anil Kumar and Mrs. Naga Purna (20th November 2011)