Special functions take a prominent position in mathematics, both pure and applied, and in many branches of science. Simultaneously, by the end of the nineteenth century, people had introduced many generalizations of Gauss hypergeometric functions by increasing the number of parameters or the number of variables or both. In this process, the conceptual understanding of these generalizations lagged far behind the well-developed ideas around Gauss' hypergeometric function which to many people means many formulas but no mathematical depth. Fortunately, developments by the end of the twentieth century turned this image around somewhat, and in this century the turnaround will be complete. Due to the importance of the special functions Department of Mathematics of PSGR Krishnammal College for Women organized Science Academies' inter disciplinary Lecture Workshop on Special Functions and their Applications sponsored by Indian Academy of Sciences (IAS), Bangalore, Indian National Science Academy (INSA), New Delhi and the National Academy of sciences India (NASI), Allahabad during 22\textsuperscript{nd} and 23\textsuperscript{rd} December 2015 to introduce generalized special functions in one and several variables and exploring the possibilities of their applications in other disciplines. This workshop included 8 technical sessions. A Total of 133 participants comprising of 44 faculty members, 89 research scholars and students from various colleges attended the workshop.

22.12.2015
The inaugural session began with prayer song. Dr. N. Yesodha Devi Secretary, PSGR Krishnamma College for Women presided over the function and offered her felicitations.

Dr. K. Srinivasa Rao, FNASc, FTNASc, Senior Professor (Retd.), IMSc, Chennai in his Opening Remarks highlighted the importance of Special functions and the contributions of Srinivasa Ramanujan using Special functions. In his keynote address on “Legacy of Srinivasa Ramanujan”, he explained about the significance of Chapter XII of Ramanujan's second Notebook on Hypergeometric series which contained 47 main theorems, many of them followed by a number of corollaries and particular cases. Dr. S. Nirmala, Principal, PSGR Krishnammal College for Women proposed the vote of thanks for the inaugural session.

Technical Session I was continued by Dr. K. Srinivasa Rao, FNASc, FTNASc, IMSc, Chennai on Special functions and Legacy of Srinivasa Ramanujan. In his lecture he narrated the history of Special functions, basic concepts and developed into deriving Srinivasa Ramanujans’ work involving Special functions.

Dr. R. Jaganathan, Professor (Retd.), Department of Physics, IMSc, Chennai, Adjunct Faculty, Department of Physics, Chennai Mathematical Institute, Chennai, in his two lectures on “q and (p, q) generalizations of Special Functions and their applications I & II” explained about the fundamentals and types of q and (p,q) generalizations in detail. He also showed that (p, q)-hypergeometric series studied by Burban and Klimyk can be considered as a special case of a more general (P, Q)-hypergeometric series.

23.12.2015

On day two, Technical Session IV was handled by Shri. S. Sivaraman, Associate Director, IRDE, DRDO, Dehradun in which he has brought out the significance of Special functions in Fire control systems. His lecture included different classifications of Fire control systems and their tasks.

Dr. N. Mohan Kumar, Former Head, Radiation transport and Analysis section, IGCAR, Kalpakkam has delivered a lecture on Special functions and Numerical integration in Technical session V. In his lecture he showed that the Gauss-Legendre, the Gauss-Hermite and Gauss-Laguerre quadrature etc are the variants of the numerical integration schemes invented by the Prince of Mathematicians, Gauss. He also showed that each of the above mentioned schemes centers on a particular special function, like the Legendre or the Hermite or Laguerre polynomials. His talk highlighted the theoretical link between the special functions and these
highly useful numerical integration schemes at the introductory level. In his lecture the speaker indicated some open problems in this area. Specifically, he elucidates how the complex singularities of the integrand affects the convergence of the quadrature and show some powerful correction schemes that involve the second kind functions like $Q_n(z)$.

In Technical session VI Shri. S. Sivaraman, Associate Director, IRDE, DRDO, Dehradun continued with his lecture on Applications of Mathematics in Defence research. He explained various Trajectory simulations of Ballistics and role of special functions in integrated intelligence command communication controls.

In Technical session VII a Documentary film on Srinivasa Ramanujan was screened for 40 minutes with interesting commentary from Dr. Srinivasa Rao. Apart from the registered participants, this session was enjoyed by around 100 students of various disciplines of our college. This film was continued with a Technical lecture by Dr. Srinivasa Rao on the importance and applications of special functions.

This workshop was attended by 133 participants. There were representations from 25 colleges. The documentary film on Srinivasa Ramanujan was watched by around 230 viewers. It can be observed from the feedback collected from the participants that they were highly appreciative of the choice of the resource persons and the adequacy of the areas covered. Apart from this there was a interactive panel discussion in which the participants were enlightened by the resource persons on various career prospects and questions related to the theme of the workshop.