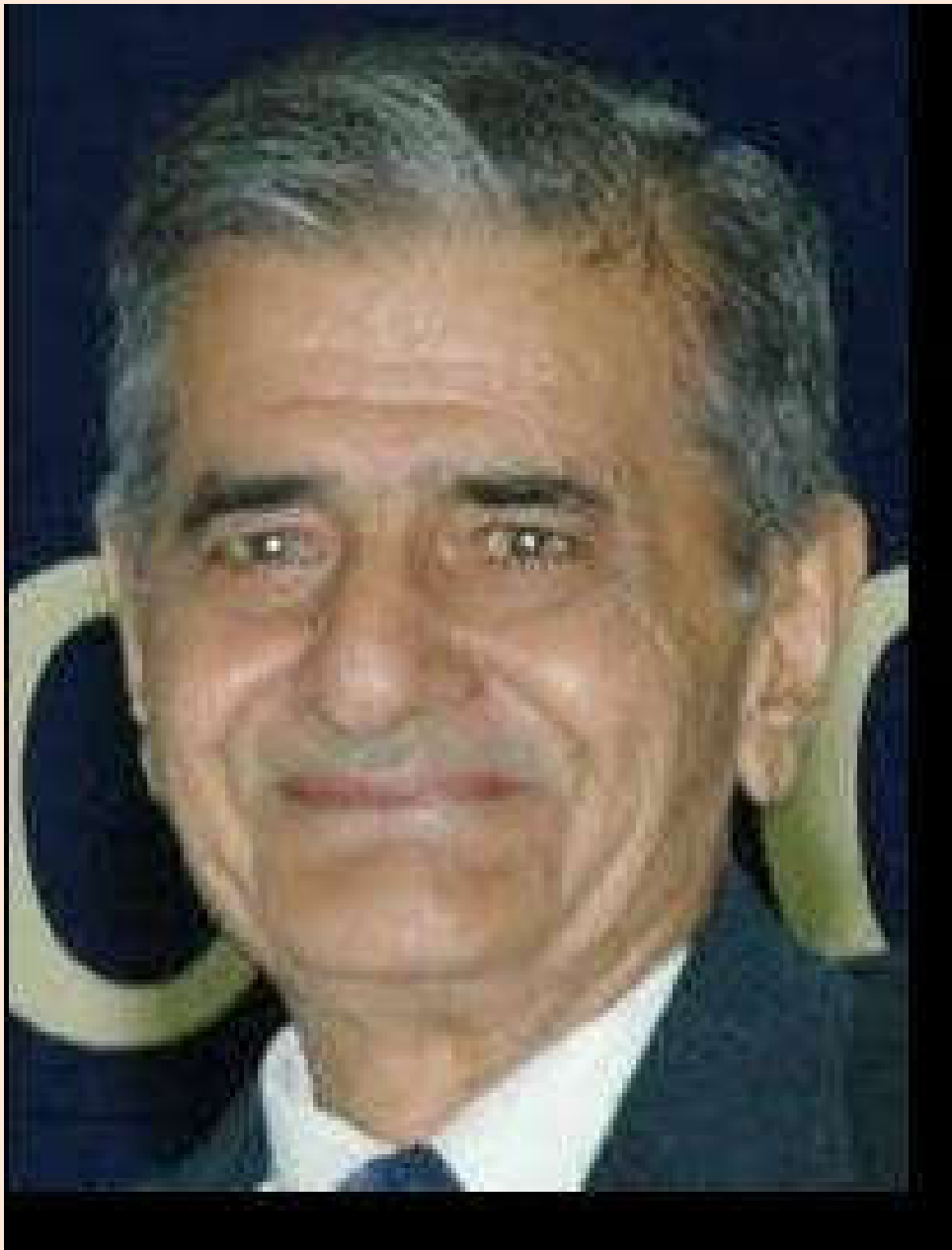


# MEMOIRS

Shri. Dev Raj Sikka



1932-2017

## Acknowledgements

INTROMET-2017 is organizing a special session which includes an invited 'Sikka Memorial talk' by Prof. Sulochana Gadgil. We would like to thank the Technical Program Committee of INTROMET-2017, who entrusted us with the job of bringing out the memoirs on Shri. D R Sikka on this occasion.

This memoir includes, a few key research ideas by Shri. D R Sikka, messages from various dignitaries, relevant photos, remembrance about the institutions that he helped to build-up, and other relevant and interesting information about his life and work.

We would like to express our sincere gratitude to everyone who contributed special articles and photos to bring out the memoirs on Shri. D R Sikka Sahib, popularly known as 'Bhishma Peetamaha' of Tropical Indian Meteorology', during the INTROMET-2017 symposium.

We would like to thank the contributors namely Dr. Ajit Tyagi (former Director- General, IMD), Dr. P. V. Joseph (Former Director, IMD), Former Directors of IITM, Prof. B. N. Goswami, Prof. Keshava Murthy and Dr. M. Rajeevan (currently, Secretary, MoES).

We also received immense support from Dr. Krishnan, Dr. Shompa Das, and Dr. V. Sasane from IITM, Pune. We also acknowledge IITM for sharing a few photos of Shri. D. R. Sikka, which are taken from IITM archives. Also acknowledge photos received from Dr. D. Sivanda Pai (IMD, Pune), and Prof. Sengupta and Prof. G. S. Bhatt (both at IISc, Bangalore).

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Dr. B. Simon and  
Dr. V. Sathiyamoorthy (SAC/ISRO)

## **Prof. Dev Raj Sikka**

Dr. M. Rajeevan, Secretary, Ministry of Earth Sciences, Govt. of India

Prof. Dev Raj Sikka was one of the pioneers in monsoon research. He made enormous contributions to our understanding of monsoon processes, variability and its prediction. He is considered as monsoon guru, as he had vast and deep knowledge in monsoon physics and dynamics. He amassed this vast knowledge while serving for the India Meteorological Department (IMD) and Indian Institute of Tropical Meteorology (IITM). Even after his retirement, he had kept his interest and involvement in tropical meteorological research. For more than four decades, Prof Sikka actively nurtured quality research and promoted tropical meteorology in the country. He had a Master degree in Physical Chemistry. In 1954, he joined IMD, and in 1962, he joined the Indian Institute of Tropical Meteorology.

His outstanding monsoon research contributions include a) discovery of northward propagation of convective clouds from the Indian Ocean into northern continent during the monsoon season with a periodicity of 2-8 weeks as revealed in daily satellite imageries, b) the relationship between tropical Pacific sea surface temperatures and Indian monsoon, which was published in 1980. Probably, this was the first paper linking the relationship between the Indian monsoon and El Nino highlighting the probability of droughts during El Nino years. The discovery on northward propagation of convective clouds had really triggered numerous research papers on intra-seasonal variability of Indian summer monsoon and has led to improved forecasting of active-break monsoon spells. In the later years, he was involved in understanding dynamical predictions of monsoon in all time scales. He always prompted researchers to get more insights to model physics and feedback processes to understand model biases and errors.

Prof. Sikka always appreciated and stressed the need for high quality atmospheric and oceanic observations, both terrestrial and space based. He believed that by improving initial conditions of the atmosphere, short range forecast skill can be further improved. Prof. Sikka actively participated in all the major observational campaigns and field experiments, starting from the International Indian Ocean Expedition (IIOE) during 1963-65. He played a major role in planning and execution of Monsoon Experiment (MONEX), a major component of the First Global Atmospheric Research Program (GARP) Global Experiment (FGGE). He was one of the main architects in designing and executing Indian Climate Research Programme with field experiment over the Bay of Bengal (BOBMEX), Arabian Sea (ARMEX) and the Continental monsoon zone (CTCZ). In addition, he was the chairman of many scientific committees of DST, MoES and MoEF & CC. He was the chairman of the scientific review and monitoring committee of the Monsoon Mission launched by MoES.

Many researchers in the country including me benefitted in closely working with him and seeking his advice and knowledge. He always liked and spent time to share his knowledge with youngsters and guide them in their research work.

He was elected a Fellow of the Indian Academy of Sciences in 1984, obtained the first Lifetime Achievement Award in Atmospheric Science and Technology by the Ministry of Earth Sciences in 2007, the Sir Gilbert Thomas Walker Gold Medal in 2012 and Lifetime Achievement Award in 2017 by the India Meteorological Society (IMS).

Prof. Sikka, in a true sense, was a great visionary and passionate monsoon researcher.

## Obituary

Air Vice Marshal (Dr.) Ajit Tyagi, President, Indian Meteorological Society

Shri DEV RAJ SIKKA, doyen of Indian Meteorology, was born on 1<sup>st</sup> March 1932 in Jhang, Maghiana in pre-partition India (now in Panjab, Pakistan). Shri Dev Raj Sikka did his M.Sc. in Physical Chemistry from Agra University with first rank in 1954.

He began his professional career from Indian Meteorological Department (IMD) in 1954. He then joined the Institute of Tropical Meteorology (ITM) in 1964 which was later renamed as Indian Institute of Tropical Meteorology (IITM) and became its Director in 1986. While at IITM, Pune, Shri Sikka was actively engaged in research and development in monsoon dynamics, tropical meteorology, prediction of weather and climate variability, atmospheric chemistry, air-sea interactions, etc. He established strong linkages with scientists and institutions engaged in research and academic activities in meteorology and allied subjects, both from India and abroad. Sikka was a proponent of dedicated field experiments to pose and test hypotheses. He was an active participant in all the major regional experiments, including the International Indian Ocean Expedition (IIOE) during 1963-65 where his intimate knowledge of monsoon meteorology profoundly influenced the success of the expedition. He was a keystone scientist in MONEX (a major component of FGGE) in 1979. He played a major role in planning and executing the Indian Climate Research Programme with field experiments over the Bay of Bengal (BOBMEX), Arabian Sea (ARMEX) and the Indian monsoon zone (CTCZ).

Shri Sikka has contributed immensely to the growth of meteorology in India in various capacities as highly distinguished research professional. He has been the chairman of the Monsoon Mission of the Ministry of Earth Sciences. He has also served as the chairman of CSIR committee on climate change, co-chairman of DST's expert committee on climate

change; and chairperson of the research and advisory council of the National Centre for Medium Range Weather Forecasting (NCMRWF). Shri Sikka has been a member of International Advisory Panel (IAP) of the Ministry of Earth Sciences. He has published more than 50 research papers on different aspects of Meteorology in peer reviewed journals and reports of international repute.

He is a fellow of the Indian Academy of Sciences and the Indian Meteorological Society. He was awarded Sir Gilbert Walker Award for the year 2010 by Indian Meteorological Society. He was also awarded by the Ministry of Earth Sciences, the “National Award for Excellence in Atmospheric Sciences & Technology”. In recognition of his outstanding contribution to the education – the academic programmes implemented by him at IITM and improved collaboration with the Indian Universities, his research work in Meteorology, especially in Tropical Meteorology, his contribution towards advancement of Monsoon Meteorology and Atmospheric Sciences & Services in India, the Indian Meteorological Society conferred upon Shri Dev Raj Sikka – the Life Time Achievement Award of the Indian Meteorological Society on 20<sup>th</sup> February 2017.

I was fortunate to have his guidance during my tenure as Assistant Chief of Air Staff (Meteorology), Indian Air Force, Director General of Meteorology, Indian Meteorological Department, Koteswaram Chair Professor, Ministry of Earth Sciences and President of Indian Meteorological Society. His critical reviews of programmes, constructive suggestions and visionary guidance were of immense help. One quality which makes him special is his helpful attitude towards young researchers. He was always available to guide and help them and in the process groomed new generation of meteorologists.

Meteorological Community has lost a mentor in the death of Shri Sikka. He inspired and encouraged young meteorologists throughout his professional career spanning over six decades and his work will continue to inspire future generations.

Shri Sikka passed away on 18 March 2017 at New Delhi. He is survived by two daughters, Poonam and Pammi. Indian Meteorological Society pays its respectful homage to Shri Sikka.

## **End of an Era**

B. N. Goswami, Cotton University, Guwahati

The demise of our beloved Sikka sahib, popularly known as 'Bhishma Peetamaha' of Indian Meteorology has left a void that would be almost impossible to fill. Although much older in age, he was a dear friend, philosopher and guide to me and his demise has been an immense personal loss to me as well. Many would rightly recount his scientific achievements and his leadership in building Institutions like IITM and NCMRWF. While his scientific contribution to Atmospheric Science from India is unparalleled, I have always been more inspired by his vision for Indian Meteorology and Climate Science and his mentoring of young talents for capacity building in weather and climate science in India. I would, therefore, only touch upon a few instances highlighting his vision and few personal encounters illustrating his passion for mentoring young talent.

Sikka Sahib was keenly aware that the Indian forecasting system (both for weather and for climate) was outdated and badly needed major upgrade. Our observation system had serious problems and there was very little capacity in forecast model development. Whatever research on modeling in academic institutions was being done, were not linked to the national forecasting system. When the new Ministry of Earth Science was formed in 2006, Sikka sahib took the opportunity and took pain to impress upon the Ministry about the urgent need. The Ministry responded well and four high level committees were set up to come up with recommendations that could be acted upon. Sikka sahib chaired the Committee on Modernization of the Observing System and came up with a set of ambitious and comprehensive recommendations. Although could not be fully implemented (for various reasons!), the state of the Indian Observing System today is far better and modernized than 15 years ago and without Sikka sahib's vision and perseverance this could not have been achieved.



To advise the Ministry on making the Indian prediction system a state-of-the-art, the MoES set up an International Advisory Panel (IAP) with Prof Jagadish Shukla as Chair and eminent modelers like Prof. T. N. Krishnamurti and Dr. Puri as members. As a member of the IAP, Sikka Sahib again stressed on his vision of making that happen, particularly on modeling. Through several deliberations at IAP meetings, IITM was able to thoroughly evaluate and implement a dynamical seasonal prediction system with a high resolution CSFv.2 as the model and indigenous data assimilation. In addition, IITM also implemented completely original dynamical extended range prediction system again using CSFv.2. Hindcast experiments and real time forecasts by the model have demonstrated excellent skill of the model in prediction of the active and break spells. Also, IITM helped IMD set up an ensemble weather prediction system using GFS with T512 resolution and deterministic forecast with a 12 km resolution global model. These developments could not be possible without Sikka sahib's constant encouragements and critical comments at important junctures. Today, the Indian prediction system is truly state of the art and Sikka sahib would be happy to see his dream come true.

Although he contributed greatly to development of NCMRWF, Sikka Sahib was particularly fond of IITM and attached to it. Soon after I joined IITM in 2006, in addition to the official meetings, he would come often to IITM and spend days interacting with young scientists and mentoring them. One day he said to me, 'I hope I would live to see the Golden Jubilee of IITM in 2012. I am sure you would celebrate it grandly and I would like to be part of it.' As Sikka sahib was associated with the IITM from its inception to its maturity, I requested him to write a monograph on 'The 50 year journey of the IITM". This monograph is indeed a beautiful account of journey of IITM from its infancy passing through childhood to adulthood and only Sikka sahib could have written it! We did celebrate the Golden Jubilee in 2012 with a major International Conference on Monsoon where almost all leading monsoon experts of the world were present. We paid tribute to Sikka Sahib and two other living past directors

of IITM in the Conference who helped charter the path of IITM to its destiny.

My first major interaction with Sikka sahib was in 1984 when as a young researcher I visited IITM in its Ramdurg House campus on his invitation and delivered a talk on my recent work on the mechanism for the monsoon 30-60 day oscillation. Based on experiments with my symmetric GCM, I proposed a convection-radiation-dynamics feedback mechanism for the fluctuations of the ITCZ resulting in this oscillation. With Sikka and Gadgil paper on the observational characteristics of this oscillation published a few years ago, there were considerable interest and there were many senior scientists from IMD and IITM present in the talk. However, most had a rather myopic view and commented as such that this is some kind of theoretical and modeling exercise with no potential for applications. Sikka sahib was the only person who was very encouraging. Through his own work he was keenly aware of the need for prediction of the active and break spells at extended range (beyond 10 days), he understood that such fundamental work is essential for eventually building a prediction system for the Monsoon Intra-Seasonal Oscillations (MISOs). With his Character-istic style he gave a long speech at the end of my talk on this. It remained as a source of inspiration to me.

Life's journey is very nonlinear. A small perturbation can change the future evolution significantly. Receiving the Bhatnagar Prize in 1995 was a large perturbation in my academic journey that determined the future course. I owe it to Sikka sahib's encouragements. No, he was not a member of Bhatnagar Committee that year! One day when we met, he told me 'Goswami, you should apply for the Bhatnagar Prize'. I told him that you don't apply for it, somebody nominates you. He gave me some names. One of them was kind enough to appreciate my work and nominate me for it. The Fellowship of the Indian Academy of Science followed soon after. I owe tons of gratitude to them.

I have an unpopular habit of arguing on scientific matters that I disagree. With Sikka sahib also it was not that we agreed on everything. There were matters where our views were different and we argued vigorously. Unlike some other senior scientists in the field, the best thing about Sikka sahib was that he never took these arguments and criticisms personally. In humanity, he was clearly far above the crowd!

That was our great Sikka sahib. Our love and respect for him as a scientist and as a person will remain forever.

## **Remembering D R SIKKA**

Prof. Joseph P.V., Former Director, India Meteorological Department

Sikka and I were born in the same year 1932. He is six months older to me. At the age of 15, during the partition of India, Sikka and his family moved to India from Jhang Mighiana, now in Pakistan. Once he narrated to my wife and me the harrowing experiences he had during those days. These moulded him into a strong person. Sikka joined India Meteorological Department in 1954, three years earlier to me. In 1962 he moved to Bombay to take part in the International Indian Ocean Expedition. I was at IMD Bombay then and we met for the first time, the beginning of a life-long association. Soon the Indian Institute of Tropical Meteorology was born and Sikka became one of its founding members. A few years before his retirement he became its director. I continued in IMD. We met often as we both shared the same scientific interest, Tropical Meteorology, more particularly, the Indian Summer Monsoon.

Sikka made many scientific contributions particularly on monsoon variability and relation between monsoon and El Nino. Beginning with IIOE, he took active part in many national and international field experiments on the monsoon. Post retirement from IITM he was highly visible as a dedicated and efficient Earth Science Manager even to his last days in 2017. Sikka had a long and happy married life. His wife died a few years earlier. He is survived by two daughters and a granddaughter. The best we can do to honour him is to emulate his example and dedicate our life to science and its applications for human welfare. May his soul rest in peace.

## **Remembered for Scientific and Administrative Contributions**

Prof. R. N. Keshava Murthy, Former Director, IITM, Pune

Dev Raj Sikka was a very dear colleague and a good friend.

We first met in 1963 when we started working at International Meteorological Center, Colaba, Bombay under the International Indian Ocean Expedition. It was a wonderful experience. We learnt about the synoptic meteorology of south Asia and the Indian Ocean and neighborhood. The daily map discussions were very thought provoking. We were receiving satellite pictures from American satellites. An IBM computer was a new arrival. We learnt basics of programming. I think this foundation helped us throughout our careers. In 1965, we had IIOE symposium. There we met Prof. T. N. Krishnamurti.

Then Sikka ji went back to IITM. I also joined IITM. Those formative years in IITM were very fruitful. He concentrated on synoptic and diagnostic studies of monsoon. I was involved in diagnostic and theoretical studies of monsoon. Some studies were pioneering, though today you might call them low hanging fruit. I was involved in the initial planning of MONEX. Sikka ji was involved in the detailed planning and execution of MONEX. I went away to PRL Ahmedabad. Sikka ji continued in IITM and became the director. The institute saw expansion and also shifting to the new campus in Pashan.

I was on the governing council during his directorship. We saw his meticulous planning and care. He was also a great host. I became the director after him. After retirement I avoided Delhi and concentrated on teaching. Sikka ji went to Delhi and was actively involved in several committees of DST and other government agencies. He was involved in approving and funding of several important projects.

Sikka ji will be remembered for his several scientific and administrative contributions.

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(Source: IITM Institutional repository)

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# Remembering Shri. D R Sikka

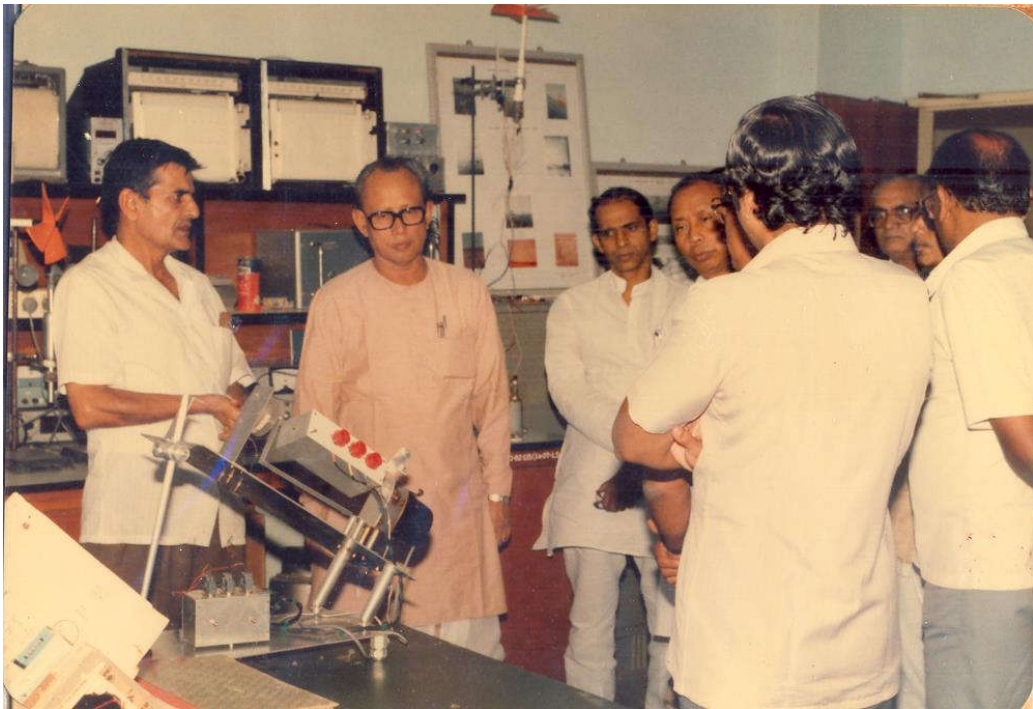
IMD, Pune



## UN-CSSTEAP SATMET students visit to IMD, New Delhi



## IITM, Pune





On the Occasion of  
INTROMET-2017 Symposium, Nov. 7-10, 2017 at Space Applications Centre, Ahmedabad.





On the Occasion of  
INTROMET-2017 Symposium, Nov. 7-10, 2017 at Space Applications Centre, Ahmedabad.

## IISc, Bangalore



## INCOIS, Hyderabad

