FOREWORD

Professor Bimla Buti is one of the most eminent plasma physicists of our country. She did her Ph.D. work with Professor S. Chandrasekhar, a creator of many masterpieces in the world of Science.

Professor Buti made impressive achievements by contributing in all stages of the theoretical developments of waves and instabilities in plasma; linear theories, effects of weak nonlinearities leading to solitons or solitary waves and strong nonlinear interactions that can give rise to turbulence and chaos. In her earlier work, she mostly concentrated on the work on the relativistic effects on various instabilities, stability of beam-plasma system that can generate new instability, namely the return current instability. She along with her collaborators worked in the nonlinear interactions of hot beam and hot plasma where stabilizing effects are shown to be due to thermal effects. She also investigated a number of instabilities including loss-cone and anti-loss cone instabilities that are applicable in the region of solar-wind plasma as well as in the domain of magnetospheric plasma.

Studies on solitons or solitary waves form a major part of her work that have made significant contributions towards the development of weak non-linear theories and the understanding of many phenomena observed in space and astrophysical plasmas. A large number of papers on this aspect of studies have appeared in many national and international journals of repute.

Recently she is involved in the more important studies of nonlinear evolution of waves leading to turbulence and chaos. In particular, she along with her collaborators has considered large amplitude Alfvén waves and has been able to show that they are governed by the Derivative Nonlinear Schrodinger equations (DNLS) which in the presence of external sources can, under certain conditions, lead to chaos in the medium. Many other outstanding results are obtained in this field.

Professor Buti's long scientific career has been very illuminating with many national and international awards, recognition and fellowship. She was awarded the Hari Om Ashram Prerit Vikram Sarabhai Research Award in 1977. She became a Fellow of the Indian National Science Academy in 1980 and recently she has also been elected Council Member of the Academy for the period 1991-1994. She has been involved in the Plasma Physics activities of the International Centre for Theoretical Physics, Trieste, Italy, and has been the Co-Director for the Plasma Physics Colleges arranged by the Centre since 1985.

She became Fellow, The Third World Academy of Sciences, in 1990 and obtained the Jawaharlal Nehru Birth Centenary Lecturership Award in 1993. After completing her term as Vice-President, Commission 49, International Astronomical Union (1988-1991), she has become President of the same Union for 1991-1994. She became also the President, Plasma Science Society of India (1992-1993).

In addition to her scientific achievements and world-wide recognition, the characteristics that command respect are her dedication, perseverance and hard work for the pursuit of scientific excellence. A large part of her long spanning scientific career has been spent at the Physical Research Laboratory. Her spirit of dedication will be sorely missed as she moves out of PRL after her superannuation. However, that certainly does not mean retirement from science for her. She will be pursuing her scientific activities with undiminished zeal, now from a different station.

We all wish her a continuing active scientific career and a glowing health.

KR Varma

(R.K. Varma)
DIRECTOR