Preface

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Srinivasa Ramanujan's spectacular mathematical contributions and the ingenious ideas underlying his discoveries have shaped the development of several important areas of mathematics. When leading mathematicians gathered in 1987 to pay homage to Ramanujan on his birth centenary, it was clear that the magnitude of the impact of his work was immense and far exceeded what his mentor G.H. Hardy had imagined. And in this quarter century since the Centenary, the influence of Ramanujan's work has continued to grow. In particular, the investigations of mock theta functions and coefficients of modular forms have led to dramatic advances. Also the influence of Ramanujan's ideas can be seen in abstract domains like the Langlands Program and related areas at the interface between analysis, number theory, and algebraic geometry.

It is the wide influence of Ramanujan's work that motivated the launch of the Ramanujan Journal in 1997. At that time, the journal was publishing four issues in one volume per year of 400 pages. Now in just 15 years, the journal has tripled in size and is publishing three volumes of three issues per volume each year, with each issue having about 150 pages. The rapid growth of the journal is a further testimony

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to the far reaching influence of Ramanujan's work on current research. It is therefore appropriate that the Ramanujan Journal is bringing out this volume to mark the 125th anniversary of the birth of the Indian genius.

A glance at the volume will reveal that the papers assembled here report major research advances in a wide range of topics encompassing arithmetical functions, Ramanujan's tau function, elliptic functions, theta functions and mock theta functions, q -hypergeometric series, modular forms, Maass forms, quadratic forms, and Poincare series. The study of identities in Ramanujan's original notebooks and the lost notebook is still not finished, and this volume contains papers on these aspects as well.

An investigation of Ramanujan's notebooks often reveals that he anticipated various aspects of the important work of several later day mathematicians. As Bill Gosper put it "Ramanujan's hand reaches out from his grave to snatch away your best theorems". The paper by Kannan Soundararajan (who won the SASTRA Ramanujan Prize in 2005) is about the formulas of Ramanujan in the Lost Notebook on what is now called the Dickmann–de Bruijn function. Ramanujan had noticed the fundamental difference-differential equation of this function and expressed it as an iterative procedure to determine its values.

We are pleased that in addition to Soundararajan, two other SASTRA Ramanujan Prize winners—Kathrin Bringmann and Wei Zhang—have contributed to the volume. The volume has also benefited from a paper by Freeman Dyson, a legendary figure in the Ramanujan world, who in the 1940s ushered in a new direction in the investigation of partition and other congruences by the construction of special combinatorial statistics.

The present volume has 26 important contributions by about 50 active researchers and the papers mentioned above are a good representative sample. We note with great sadness that there is a paper by Marvin Knopp and Geoffrey Mason which has appeared just a few months after Professor Knopp passed away. Knopp was an enthusiastic supporter of the idea to launch this journal and served on the Editorial Board since its inception. He would have been proud to see this volume come out.

All papers have been arranged according to the date of their submission. The only exception is the first article which is an interview by Robert Schneider of George Andrews, Bruce Berndt, and Ken Ono. The interview addresses the effort to edit Ramanujan's Notebooks, the unbelievable story of the uncovering of Ramanujan's Lost Notebook, and the surprising connections between mock theta functions and Maass forms that have been realized in recent years. The volume opens with this interview to set the tone and mood for what is to follow.

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