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# **INSPIRATIONS FROM SCIENTISTS OF MANIPUR**

*Edited by*

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## PREFACE

The present book entitled “*Inspirations from Scientists of Manipur*” published by the **Research Institute of Science and Technology (RIST), Imphal**, is designed as a collection of personal autobiographic narratives and memoirs by some of the scientists of Manipur, with the aim to inspire the young minds and budding scientists of this region. This compilation is mainly focused on the turning points during their successful academic careers, and it may definitely ignite the minds of young college and high school students, to opt for basic sciences in their educational careers, and also to bring excellence in their future scientific research. These autobiographies on the lives and works of some of the scientists of Manipur, will also serve as a source of role models for younger generation, and the basis for imparting a scientific culture on our society.

The genesis of this underlying concept in the form of the present book, arises from a similar publication entitled, “*One Hundred Reasons to be a Scientist*” published by The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy (2004), which is based on a number of brief and personal accounts of some of the most eminent scientists of our time, from all over the globe, including many Nobel laureates and Fields medalists. This attempt was made to address the diminishing trends on the interest in basic sciences by the brightest students at the high school level while our societies have come to depend on technological advances as never before.

We circulated our invitations to contribute the articles in the form of autobiographical sketches as wide as possible to many scientists of Manipur, who are working in India and abroad. About thirty scientists graciously honoured our invitation to contribute in the book and most of them have good connections with the earlier activities of the Research Institute of Science and Technology (RIST), Imphal. With the understanding that the present endeavor is a continuing process, the compilation of the present book as the first volume of its kind, has been initiated with the expectation that the next volume may accommodate the other promising scientists of this region.

The present book has some other important relevance and impact in the context of framing the science policy of this region. It will definitely serve as a testimony to the existing scientific culture to our society, with the fact that our society has a large number of distinguished scientists all over the globe. The people of Manipur wishes to emphasize that the region qualifies for serious initiatives for nurturing its rich human resources by establishing institutes of national importance such as Indian Institute of Science Education and Research (IISER) and Indian Institute of Technology (IIT) in this region in the near future for effective participation at the national and international level. Such constructive initiatives from the Government of India, may definitely neutralize the geographical isolation and other regional disadvantages.

The contributors of the present book, are drawn from three broad sections to cover the entire spectrum of our society – (i) pioneering scientists of Manipur, who had passed away, (ii) veteran scientists of Manipur, who are still alive but retired from service, and (iii) promising younger

scientists of Manipur, who are actively engaged in the cutting-edge research. Though our special focus is given to the veteran scientists in the second category, we try to collect short biographical profiles of our departed scientists from all available sources such as e-pao.net and also from personal interview records with the family and close friends. We are giving our befitting tributes to those departed souls. The present list of contributors, may be somewhat arbitrary and but it depends on the author's predilections, opinion and knowledge. In order to maintain a uniformity in the entire presentations in this book, special emphasis has been given to the following points in the preparation of the personal accounts in their autobiographical sketches:

- Background which emphasizes the early educational career and the moment when it became clear to author that a career in science, was what he/she preferred.
- Some crucial turning events and personalities that might have influenced his/her decision to opt for a career in science (his/her field).
- Some opportunities/challenges author had in the entire educational career to reach the present position.
- His/her scientific research works, the area he/she works in, and how he/she got interested in this line of research.
- Messages that he/she wants to convey to youngsters who are seeking an academic career in scientific research.
- A clear vision on the next scientific pursuit if any.
- Suggestions, remarks and policies on science education and scientific research on our native place, Manipur.

We always prefer to preserve the original and unique style of the individual author while writing the article as far as possible, but with minimal editing if necessary. We wish to acknowledge the encouragement rendered by Prof. Konsam Ibo Singh, the former faculty member of Political Science Department, Manipur University, to complete the project successfully and other helps in the proof reading of the manuscripts. A special acknowledgement goes to Shri Longjam Ranendra Singh, senior advisor of RIST, Imphal, for his erudite and untiring efforts in the process of proof reading and editing of the manuscripts, and also for accepting to write the "FOREWORD" of the present book. We are also thankful to Dr. N. Monoranjan Singh for his technical support in formatting the photos of the contributors, and also Dr. Soram Robertson Singh for typing the manuscript in Latex format. Finally, we wish to extend our best appreciations to all contributors for graciously honoring our invitation with the hope to help in inspiring our younger generation. The collection and compilation of biographical profiles of our departed scientists in the first section, was a very difficult task and we extend our warm gratitude and thankfulness to all who contributed to it in different ways to complete the book.

We highlight the following few but pertinent points in support of our effort in basic science education. In this region there is a huge regional disparity resulted from the increasing technological gap and digital divides with the rest of the country. Such disparities are major obstacles for imparting quality education in science and technology, and basic scientific research

in this region. The region requires at least some dedicated research institutes of national importance for meaningful participation in the cutting-edge research activities at the global level from this region as a process of globalization of higher education.

As emphasized by UNESCO Forum, the sustainable development of a nation can only be achieved through proper implementation of a synergy between higher education, scientific research and innovation. Such a new partnership is the key to global changes in the era of 21<sup>st</sup> century. With the emergence of globalization, there has been a growing demand of quality higher education and research all over the world, though it has brought both opportunities and threats to the existing higher educational institutes as they require some immediate measures to meet the global competencies. Though the overall conceptual part of scientific research is global in nature, its practical implementation requires a region specific science policy. It emphasizes the need for the study of basic sciences for meaningful participation in the cutting-edge research activities at the global platform.

In the present global scenario of science policy, it is generally considered that the developing world and poorer nations are expected to focus only on applied problems that can prove direct results to the nation's economy. However, the bias on basic sciences in the name of less economic value, is not a very good concept. In applied sciences the goal is merely to use research as a tool, but research in basic sciences is to become a valuable and self-sustaining pursuit in its own right. Research in basic sciences will generate a completely new knowledge which can lead the heart of modern economy. It may not give us an instant result but it will give us a deeper understanding about the world that changes all the time. In fact, new focus on basic science will produce a lasting change in science of a nation and it is a paradigm shift in scientific revolution.

Research in basic sciences also offers an opportunity for scientists of poorer nations to stand on their own feet without the need for international supports to assess the scientific questions of their own nation and to contribute to the universal quest for knowledge. It encourages the freedom of scientific pursuits. The researchers themselves are encouraged to set the agenda for innovation and discovery to boost its research quality and innovation, in the process to strengthen the scientific foundation of the nation. In the history of science, it is practically impossible to find a piece of technology that cannot be traced back to the work of scientists motivated purely by the desire to understand the world.

Our expectation is that the present book will serve its purpose and we plan to continue such projects in future. We wish that the book will definitely be an important addition to any library, personal and institutional, and will make the endeavor a successful one.

N. Nimai Singh

Editor

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## FEEDBACKS ON THE BOOK 'INSPIRATIONS FROM SCIENTISTS OF MANIPUR'

1. Inspired by the monumental work "One Hundred Reasons to be a Scientist", this book "Inspirations from Scientists of Manipur" is the first in the series of collection of past and present pioneering scientists of Manipur working in and around the globe. With the intent to inspire younger generation of scholars, this volume has contributions from the scientists in their own words what motivate and shape the chosen path. It also pays homage to some of the avant-garde scientists and practitioners.

*Prof. Rajen Laishram, Political Science Department, M.U.*

2. The advancement of scientific research in Manipur has historically faced formidable challenges due to inadequate infrastructure, deficient laboratory facilities, limited equipment, and insufficient funding. Nonetheless, the concerted efforts led by Dr. Ng. Nimai Singh and his colleagues, renowned scientists in their respective fields, have effectively established a distinct niche for scientific endeavors within Manipur. This book presents detailed documentation of the endeavors undertaken by the scientific community in Manipur, shedding light not only on the historical trajectory of scientific activities but also on the evolving patterns of scientific development within the region. The significance of this book lies in its utility as an indispensable resource for individuals seeking insights into the scientific landscape within Manipur's academic community.

*Prof. Th. Ratankumar, Department of English, M.U.*

3. The book is a collection of stories of different scientists of Manipur having different areas of interests in science, from different backgrounds. The common thread in the book is the inspirations given to the readers in general and next generation in particular. The life and works of each scientist are narrated in order to train minds with a scientific temperament and with a scientific methodology. The life sketch of scientists over years also gives a progression of scientific ideas in Manipur. The story telling is divided into three sections: 1) scientists who left their stories and experiences as a capital; 2) veteran scientists who differentiate the scientific courses in different fields of science; and 3) the younger specialized scientists in their fields. All the stories are around one issue: inspire the people to be scientists in all aspects of life, in both ordinary life and academic & professional life. It is not a collection of articles on a single theme; it is a book on different scientists but for a single goal: make science part of our life.

*Prof. M.C. Arun, Department of Anthropology, M.U.*

4. This book "Inspirations from Scientists of Manipur" published by "Research Institute of Science and Technology", is a treasure for Manipur. The lessons on commitment, dedication and persistency are the keys for the youth that would open all doors for them to achievement and success. No doubt, this book will trigger and ignite the minds of generations of youth to scientific thinking and innovation. I congratulate one and all involved in developing this valuable book for the benefit of the society.

*Prof. Leihaothabam Jibon Kumar Sharma, MIMS, M.U.*

5. The book entitled “Inspirations from Scientists of Manipur” is a remarkable compilation that not only honours the achievements of renowned scientists (departed scientists, living veteran scientists, and young working scientists) from the state of Manipur but also serves as a beacon of inspiration for budding scientific minds across the region. By highlighting the personal autobiographical accounts, the book shares the most pivotal moments and influences that help shape the scientific journeys of its contributors. Through its heartfelt narratives and valuable insights, the book will ignite a passion for basic sciences, encouraging young students, researchers, faculties to pursue careers in scientific research seriously. Having shown a clear vision for the future of scientific research in Manipur and a dedication to fostering a scientific culture, this book stands as a testament to the rich talent and potential in this region. I am sure the book will serve as an invaluable knowledge resource for both personal and institutional libraries and leave a long-lasting impact on readers.

*Dr. Potshangbam Nongdam Puren Meetei, Biotechnology Department, M.U.*

6. The first name I saw was of Dr. Laifangbam Nanda Babu Roy, which made me read the book without any further check; my own continual life in this world is owed to him. This is a book to be read by all – youths as well as the adults of Manipur – to think of the immediacy of a new direction for the society.

*Prof. Amar Yumnam, Economics Department, M.U.*

7. Compilation of work and life history of renowned scientists with a vision to inspire the coming generation to pursue science in a single book, is very rare. This book will serve as an encyclopedia, guidance, and an eye opener for the school and college students specially, those from the less privilege rural areas, who want to become a successful scientist one day by learning the thrills and challenges of a scientist from these scientists of Manipur.

*Dr. Ng. K. Francis, Physics Department, Tezpur University.*



## **Research Institute of Science and Technology (RIST), Imphal.**

*An Institute for Research and Innovation, founded in 2010 at Manipur University,  
and registered in 2012 (No.535/M/SR/2012) in Imphal.*

**Our Mission:** The purpose of the Research Institute of Science and Technology (RIST) is to engage in research, discovery and innovation in science and technology.

**Our Vision:** RIST strives to advance science and technology through scientific research and exploration. Our vision is to establish a dynamic centre in Manipur, engaged in research in areas of science and technology to advance the understanding of nature and to explore the power of innovation. Our envisioned future is a world-class institute in Manipur to ensure a sustainable future for the region, nation and world.

**Our Goal:** Since its founding, our near-term goal has been the establishment of a research institute in Manipur with support from the Government of Manipur and national funding agencies, adopting the path followed by other premier research institutions in India in their formative stages, viz. TIFR in Mumbai, PRL in Ahmedabad, IASST in Guwahati.

**Our Strategic Plan:** The strategy for research in the formative stage of RIST has been developed in consultation with leading scientists in prominent institutions in India and abroad. In view of the limited resources, the current efforts are targeted at areas of direct relevance to the Northeast India as well as the national priorities, and with high expectation for important outcomes.

RIST has been actively organizing research seminars since its inception, its scientists have published articles and participated in international and national conferences.

The present resources of RIST are entirely from contributions from individual benefactors and has been a serious limiting factor in initiating and executing our research goals. Further, to be eligible for funding from the national agencies sponsorship by the state government is required. Considering these requirements to meeting our goal of establishing RIST in Manipur, we request financial and other support from the Government of Manipur.

**Office Premises:** At present RIST does not have its own premises to function from, and it is functioning from Manipur University Complex through a memorandum of understanding (MoU) between Director, RIST and the Vice-Chancellor of Manipur University, signed on 28<sup>th</sup> November, 2019 till a permanent or alternative arrangement for accommodation of the institute is arranged.

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