Epilogue

The book is a comprehensive record of novel ideas and experiments traversing across various discipline viz. physics, mathematics, musicology, psychology, psycho-acoustics and most importantly neuro-science. This epilogue looks at themes and trends that hint at future journey of exploring musical rhythm of brain in the light of findings detailed in this book. In this age of nano-technology, when the focus is mostly on the finest details of matter, there is a need to revisit the idea of keeping “mind over matter”. The ambitious Big Brain Project of the US Government hopes to obtain brain wiring diagrams that will reveal patterns of neural activity giving insight into the underlying basis for sensory function, thought, memory and emotion—and will provide a new understanding of what in these circuits goes awry in psychiatric and neurodegenerative diseases. Similarly, the experiments reported in this book try to harnesses the immense power that music (specifically Hindustani music) has to offer in regulating or often changing the brain states of individuals. We sincerely hope that this book will encourage more people to take up music as an effective therapeutic agent and use it in a more scientific way. A number of novel signal processing tools for feature extraction from EEG/sound signals which will be beneficial for future students/researchers who wish to do innovative works in this eccentric field of research.

Future works in this direction include one of the most challenging one i.e. “music of the brain”, which essentially means sonification of the low-frequency EEG signal and making it audible to the human ear. This will also lead to the manifestation of a direct correlation between an EEG signal and a music signal—a pioneering work in this domain. The simultaneous neural processing of melody and rhythm in different sections of the human brain is also an interesting area of future research. How do the variations of linear features like amplitude, pitch, timbre etc. affect the non-linear parameters like Hurst exponent, Multifractal spectral width is also a fascinating area of research. We know that if the dynamics of a certain raga goes wrong, or certain phrases are interchanged, seasoned listeners can identify perceptually, but what are the neural manifestations of the same is unknown and could have enthralling implications. Summing up, this extraordinary research area throws wide a number of problems for inquisitive researchers.
It may not be out of place to mention that Sir C V Raman Centre for Physics and Music, Jadavpur University, India, since 2010 is relentlessly working to develop fractal analytics representation as a superior alternative to linear analytics approach for scientific study of the cognitive aspect of Hindustani music. This book will go a long way with the aspiration that physicists, musicians and neuroscientists are woven in the same fabric. Remembering Tolstoy’s expression “Music is the shorthand of emotion”…

Thus, Quest for Knowing the Unknown Continues.........