



## G.S-6

## Vedas, Gita and Modern Science \*

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## Abstract

In the extra-ordinarily busy world of today much of the material advancements owe their origin to the work with Science – the modern sciences, in particular. The diverse areas of engineering, technology and their applications leading to commendable developments in and around, go to unambiguously show that we need to profusely thank and respect the man-made progress in mastering many aspects of nature. The trend towards further forward movements is bound to continue.

Nevertheless, we have to realise clearly about the serious limitations of the current successes achieved in the realm of earthly human activities. On the one hand, without the full backing and contribution out of the command and maturity as exhibited in the Vedic wisdom there would not have so much been attained, but on the other no sufficient attention is given so far to grasp well the ancient Vedic concepts and Vedantic thoughts, as suited to the evolving times. Majority of the breath-taking revolutions and discoveries with far-reaching consequences like in physics, mathematics, biology, chemistry, computers etc. have their roots and explanations in the Vedic words, mantras and so on, finding explicit expressions in the Bhagavad Gita (16,17) the divine song, in quite transparent terms.

There already exist immeasurable amounts of experience, efficient expertise and erudition, collected in the spiritual scriptures and literature of this great country of ours. We do have extremely important and valuable documents available comprising reliable data and directions for creative work of the highest order. Vedas are the grandest universal heritage and rich source of much of the advanced innovations.

Gita has proved, beyond any doubt, its unique efficacy as the embodiment of practical enlightening guide for almost all problems and situations. In its exceptionally beautiful, remarkably simple rendering, Gita has excelled others as much as it meets straight every variety of needs of the entire human race/life. In fact this exquisite creation of the Lord has right answers even to the most difficult questions arising in varied, tough avenues. They are worth our careful study, comprehension and following in our day-to-day living with the hints and advice provided by Gita.

We examine some of the significant features of Bhagavad Gita, as seen from the present perspective, since this composition exposing and exploring the very quintessence of constructive acumen and ever-lasting pure knowledge embracing true love to know and serve, is in His truly blissful call for the devoted action to all.

## I Introduction

Om Amriteswaryai namah.

Respected Chairman, learned members on the stage, of the audience and friends,

I am extremely happy to be here this morning to participate in this International Conference, the World Con-

gress on Vedic Sciences, being organized under the aegis of Vijnana Bharati.

Let me at the outset express my grateful thanks to Prof. Dr. Vasu, under whose Chairmanship this important event is taking place, for invitation.

This, indeed, is a memorable occasion for me. Basically my main views can be summarized thus:

(i) We have a great lot of excellent knowledge on the spiritual heritage embedded in the venerable and connected pronouncements and writings as for example, the inimitable Srimad Bhagavad – Gita, embodying much of the ever lasting wisdom of the East,

(ii) There have been many important developments in the various fields of Science, Engineering and Technology, particularly in the immediate past few decades, arising from the West,

(iii) It is felt urgently required to effect a proper, wholesome synthesis between the two apparently very different cultures(18), one of the heart and inner spirit, and the other largely external, of the hand and mind.

Keeping clearly in view the current imperative before the humanity, namely to unite the distinct forces and potentials within our reach for the peace, harmony(19) and benefit for all, one may examine carefully every aspect with respect to understanding, appreciating and applying the products of learning and meditation. It is our bounden duty to try to achieve a purposeful unification in our thoughts and deeds.

I quote from AMMA(9):

“A knower of self has dissolved his mind completely thro’ constant and intense spiritual practice as a result of which his mind is fully fixed on the Supreme. Because, he is one with that, he can see everything as that.”

Dr. Radhakrishnan says:

“though the experience is beyond reason, it is not opposed to reason”,

“the Upanishadic approach is both objective and subjective”,  
“the significance of the physical world (anna) is disclosed in the biological(prana); that of the bio – in the psychological (manas); psychological - in the logical and ethical(vijnana); logical - finding its meaning in the spiritual (ananda)”.

We shall go into some of them in the sequel with an aim to realistically and truthfully follow both the worlds to usher in a third, an amalgam of the best in both.

## II Modern Science

It is incumbent on us and useful to recall briefly about the genuinely wonderful gifts of science to humanity as a whole. Particularly in the past few decades the fast pace of scientific progress has been stunningly remarkable.

Take any field of science (by implication most of the other avenues also can be included) – physics, chemistry, biology ..... and their offshoots observed in terms of the vastly quick growing technological achievements. What one could not even believe by any stretch of imagination that might happen, are actually opening up in ever so many directions and dimensions. The explorations into the interior regions of matter and at the same time the ulterior far away realms of space have pushed man much more than ever before almost into a dreamland. Nothing seems to be impossible today (or at least tomorrow) to be attained thro’ sheer hard, well-planned work. As luck would have it, nearly all branches of the modern science, can and will converge together to form a consortium to accomplish higher and better





than just at present. Even sky is not the limit for man's inventive intelligence to reach out as the researchers have proved beyond any doubt or bounds.

Modern sciences are set for boldly meeting plenty more challenges and win.

### III Vedas (4.8)

Vid is the root of "to know" and Veda literally means knowledge. Vedas refer to the various kinds of spiritual literature, having two principal domains, the Mantra and Brahmanas. They fall vividly into two distinct portions according to their themes, one dealing with the performance of rituals (karma - kanda) and the other chiefly devoted to pure knowledge (jnana kanda). The 108 Upanishads are under the second category.

Thus all the advances in sciences and applications thereof, we may say, are now, as then, the direct consequences of the continued efforts and proficiency attained with their firm base in the Vedas.

While describing the divine manifestation, Krishna declares "Of all the Vedas I am the Sama veda: Vedanam sama vedosmi(22/X)".

The three other vedas are: Rig, Yajur and Atharva.

The valuable Vedic spiritual base also includes the well-known Puranas apart from the Upanishads and others as well. Vedas are the repositories of the Indian heritage (12). Samaveda and the companions emanated from the very breathing of the great personality of the Supreme Godhead. It does take care of several important aspects of the understanding of Vedas.

Samaveda has 16 Upanishads under it: Kena, Chandogya, Aruni, Maitrayani, Maitreyi, Vaja sucika, Yogacuda mani, Vasudev, Mahat, Sannyasa, Vajra, Kundika, Savitri, Rudraksajabala, Darsana, Jabali.

Sri Adi Sankaracharya has composed a descriptive commentary on the Chandogya Upanishad.

Poet-philosopher Vyasa, directly and firmly connected with Bhagavad Gita, is named Veda Vyasa which justifies the significance given to Veda. Our ancient Rishis furnished the detailed explanations of the Vedas in terms of Smritis, which are quite significant from the modern scientific point of view as well. Srutis are again important too.

As we can clearly visualize, the spirit of vedic model of the knowledge generation, utilization and improvement that sprang from the Lord is up-to-date even from any strict standards set with a forward-looking imaginative strategy for success in the inner as also the outer world.

In Swami Chinmayananda's profound words paraphrased: The bulk of the Sama-veda is nothing but the essence of the Rig-veda and the latter is considered as the most important of all the four Vedas. In Chandogya Upanishad this samaveda is beautifully glorified. Hence there is an added joy of the music as much as, the Samans are to be sung in special, complicated but tasty tunes, the melody and rhythm of which are evidences revealing a mighty art that has been exquisitely developed by our ancient sages and saints. Through the beauty of comparison we may read that Krishna is the infinite Essence of Science, tuned carefully into a mimic of perfect music, as Rig-veda mantras are actually the Samans.

Along with His connection of Vasava among the gods, mind among the sense organs and intelligence among the living beings we have in this enthralling revelation the very gist of purity of thought and perfection of brilliant creative action.

### IV Srimad Bhagavad-Gita

In Sri Mahabharata consisting of over a lakh of stanzas composed by Sri Veda Vyasa, in the section called Bhishma Parva, in the Upanishad of the Bhagavad-Gita, the knowledge of Brahman, the Supreme, the Science of Yoga and the dialogue between Sri Krishna and Arjuna, this is the eighteenth discourse designated:

"The Yoga of Liberation by Renunciation". This is how the last chapter of Gita with 78 slokan ends.

The first chapter of the discourse (with 49 slokas) is designated: The Yoga of Despondency of Arjuna.

Second Chapter (72 slokas) — The Yoga of Knowledge,

Third " (43 slokas) — The Yoga of Action,

Fourth " (42 slokas) — The Yoga of Renunciation of Action in Knowledge,

Fifth " (29 slokas) — The Yoga of Renunciation of Action,

Sixth " (47 slokas) — The Yoga of Meditation,

Seventh " (30 slokas) — The Yoga of Knowledge and Realization,

Eighth " (28 slokas) — The Yoga of The Imperishable Brahman,

Ninth " (34 slokas) — The Yoga of Sovereign Science and

Sovereign Secret,

Tenth " (42 slokas) — The Yoga of Divine Manifestation,

Eleventh " (55 slokas) — The Yoga of Vision of the Cosmic Form,

Twelfth " (20 slokas) — The Yoga of Devotion,

Thirteenth " (34 slokas) — The Yoga of Discrimination of Kshetra

and Kshetrajna,

Fourteenth " (27 slokas) — The Yoga of the Division of the Three Gunas,

Fifteenth " (20 slokas) — The Yoga of Supreme Self,

Sixteenth " (24 slokas) — The Yoga of Division Between the Divine and

Demoniacal Attributes,

Seventeenth " (28 slokas) — The Yoga of the Three-fold Faith.

The great practical philosophy of Krishna enunciated in the 700 slokas of Gita is the concise summary of the entire gamut of blissful vedic wisdom and the cream of sublime knowledge of everything including the totality of life of all for ever, everywhere. Here is a unique presentation of the highest and the best that any one can ever dream of.

### V Excerpts from Gita

| Chapter       | Stanza No. | Brief Excerpt and Meaning                                                                                       |
|---------------|------------|-----------------------------------------------------------------------------------------------------------------|
| II-Sankhya    | 47         | Karmanyevadhikarasthe...To work alone is your right-                                                            |
|               | 48         | Samathwam yoga uchyathe...Equanimity is yoga-                                                                   |
| IV-Jnanakarma | 12         | 50 Yoga karmasu kowsalam...yoga is skill in work-<br>Siddhir bhavathi karmaja...fruit of action comes fast-     |
|               | Sanyasa 38 | Nahi jnanena sadrusam pavithra miha vidyathe...<br>there is nothing so purifying here as knowledge-             |
| V- Sanyasa    | 18         | Panditha samadarsina... The learned look with equal eye-                                                        |
| VI-Dhyana     | 5          | 29 Suhrudam sarva bhutanam...well-wisher of all beings-<br>Uddharetatmanaatmanam...One should raise oneself up- |





30 Yomam pasyati sarvathra sarvam cha mayi pasyati...  
One who sees Me everywhere and sees everything in Me-  
40 Nahi kalyanakrit kaschil durgatim thatha gachhati...  
doer of good never comes to grief-  
VII- Jnana Vijnana

7 Mayi sarvamitham protham Soothre Manigana Eva...  
In Me all these are strung as gems in a string-  
8 Pranava sarva vedeshu...Syllable Om in all Vedas-  
VIII Akshara

Brahma 13 Omithyekaksharabrahma...Om the syl-  
lable which is Brahman-

21 Yam prapya na nivarthante...attaining which one  
never returns-(Blackhole)

X-Vibhuti 22 Bhutanamasmi Chetana...In Beings I am con-  
sciousness-

30 Kala Kalayatha maham...Of reckoners I am time-  
32 Atmavidya Vidyam...Of Sciences I am Metaphysics-

37 Muninamapyaham Vyasa...Of Sages I am Vyasa-  
XI-Vishwaroopa

33 Nimitha Mathram Bhava Savya Sachin...  
Only be an Instrument-

XII-Bhakthi 5 Kleshodhika tharasthesham...

Trouble greater for those who deal with the unmanifest-  
XV-Purushothama

6 Yathagatha na Nivarthante...Having gone never return-  
XVIII-Mokshasanyasa

66 Sarvadarman Parithyajya Mamekam Saranam Vraja-ma  
sucha..

Leaving out all activities surrender to only Me, do not  
worry-

In the above select extract of 22 deep, meaningful,  
pithy statements by Krishna to the worried, anxious, upset  
Arjuna(us all) we discover an utter, absolute awareness of  
the problems of all kinds that the modern sciences also at-  
tempt to solve. Each is so rich in import and value that we  
can envision here the entire divine wisdom, so clearly char-  
acterized.

## VI Fundamental Theoretical Physics (11)

As an index of programs in the work on modern  
science we shall consider some aspects of physics, which en-  
compasses the widest area of intellectual coverage as of now.

Everything in life and much beyond must ultimately  
be dictated and governed essentially by the rigorous and strict  
laws of physics. The philosophy of reductionism encourages  
this assertion. In principle, the subject of psychology can be  
reduced to biology, biology to chemistry and chemistry to  
physics.

At the deeper layer of reality we should be able to  
explain the entire universe in terms of the fundamental con-  
stituents of matter and radiation. A proper, complete theory  
of these is what all are looking for, as it could be the true,  
final theory of everything(toe), including in principle, perhaps  
the mysteries of the origin of life and even the nature of con-  
sciousness and super-consciousness (13).

Today's quests in the nanosciences and technology,  
amino acid sequencing in protein studies etc., point to the  
dire necessity for investigating in the realms of modern sci-  
ence and higher mathematics.

Rise of modern era beginning with the epoch-mak-  
ing contributions of giants like Galileo, Newton, Laplace and  
in earlier times the eastern explorers and thinkers like  
Kanadan, Aryabhata,... has encouraged us to pay attention

to the most basic, ultimate constituents of nature. A unified,  
neat description of all elementary particles, forces, space and  
time is needed. Maxwell's equations, Planck's quantum hy-  
pothesis, Einstein's relativity theories, ...are, needless to say,  
immensely rich and quite conspicuous milestones.

Unification has always been at the core of science.  
Every attempt at analysis, synthesis and creative break-  
through has strengthened our insight and appreciation of the  
edifice of information and enlivened the inspiration. The  
world of sub-atomic and sub-nuclear particles is full of inno-  
vative ideas, from fresh flashes towards comprehending the  
Mother Nature at her best. Leptons(light particles) and  
baryon(heavy particles) represent one stage of classification,  
while fermions(half-integral spin) and bosons(integral spin)  
depict another method of visualization of these most tiny  
material objects. Hadrons (strongly interacting particles) form  
an important class.

Quarks (up, down, strange, charmed, beauty and  
truth) invented by Murray Gell-Mann and Zweig, though  
not experimentally observed so far, have helped in the un-  
derstanding of particles. These form the content of hadrons.

The study of particle properties, mutual interactions  
and other related problems and phenomena occupy a good  
deal of time and effort on the part of scientists all over the  
world. Group-theoretical methods have been of maximum  
assistance in unveiling many features of particle physics:  
In singlets, doublets, triplets, octets, decuplets... the occur-  
rence of the elementary objects has been observed.

The basic forces of nature(electromagnetic, weak,  
strong and gravitational) are desired to be put together and  
treated as manifestations of a single unified force. Now the  
electromagnetic and weak forces have been unified as the  
electroweak force.

Feynman graphs, as visual representations of par-  
ticle interactions, have contributed much to the understand-  
ing of particles and their mutual reactions. Symmetry and  
supersymmetry considerations are of extreme value. The in-  
variance principles and conservative laws play dominant  
role. Modern model gauge theories have been successful to a  
great extent and today we have the standard model of the  
fundamental particles, widely accepted. New methods, tech-  
niques and ideas do come up from time to time enabling  
progress in grasping the inbuilt secrets of nature's rather  
mysterious ways.

## VII Gita and String

It was exactly 18 years ago that I first met Edward  
Witten in Berkeley during the International Congress of  
Mathematicians(ICM - 1986). He talked about his favourite  
subject of superstrings in particle physics. After the talk I went  
up the stage and told him that in Gita there is a lovely and  
deep statement summarizing in a way many things that he  
was explaining. He got deeply interested and spoke to me  
for a while.

The string concept has many salient features:

- (i) Can lead to finite results, (ii) Gravity is taken account of,
- (iii) Property of scale invariance, (iv) Two-dimensional pic-  
ture is OK,
- (v) Local nature of theory is attractive, (vi) Closed loop string  
makes sense,
- (vii) Particle picture can be understood, (viii) Importance of  
geometry emphasized, (xi) High level mathematics used,
- (x) New maths may be required, (xi)  $3 + 1 = 4$  dimensions  
acceptable, (xii)  $10 - 4 = 6$  dimensions curled up!





(xiii) Predictive power, (xiv) Very high energy needed ( $\sim 10^{19}$  GeV Planck scale), (xv) Distance problem ( $\sim 10^{-33}$  cm), (xvi) Computational aspects, (xvii) 496 gauge particle—too many, (xviii) String Membranes question!

The super string theory with its beautiful mathematical perfection is a worthy successor to electromagnetic theory, electro-weak theory, QED, QCD, Super gravity, Super symmetry, QFD... It is a gigantic, fascinating industry of theoreticians and experimentalists dealing with and describing the smallest object of the creation, which would nicely tie up with the largest, mighty cosmological giants at large in far away regions of the universe.

The string theory initiated in 1974 became known as Superstring theory taking care of the most vital gravitational force also.

Some actors in the string drama:

John Schwarz – Caltech USA; Edward Witten – Inst. of Advanced Study, Princeton; Michael Green – QMC, London; David Gross – Princeton University; John Ellis – Cern, Geneva; Abdus Salam – ICTP, Trieste, IC, London; Steven Weinberg – Texas; Joel Scherk – France; Veneziano – Cern, Geneva, Richard Feynman – Caltech, USA.

### VIII Gita String

In the profound 7<sup>th</sup> stanza of the 7<sup>th</sup> chapter on Jnana Vijnana Yoga of the Bhagavad Gita, Krishna proclaims "mayi sarvam idam protham soothre mani-gana eva", meaning "all this is strung in Me like the clusters of gems or pearls in a string".

What does the Lord mean by saying so?

He is the common, singular factor, linking all forms and objects in the whole universe. He holds all of them intact just as a string or thread holds the pearls in a necklace secured together. Every word used here is significant. The image is beautiful and quite meaningful physically as also philosophically. The thread, generally, unseen outside goes through every piece of the pearls and carries thro' every-bit in a nice, safe manner. The emerging scenario is strikingly marvellous, of course.

The gem and thread materials differ very much from each other and their roles are different. In the same way the world around comprises infinite variety of visible shapes and qualities. Nevertheless, everything is firmly held together by an underlying power of spiritual truth making the whole thing wholesome and holy. Krishna wants to impress upon us all that His exquisite presence would make all the changes adding profusely to the purpose and aroma of eternal value. The necklace running thro' every pebble, the Antharyamin awakens everyone and multiplies the growth of the inner purity and health.

### IX Superstring (7)

It is not elementary particles, the most basic, any more, but the superstring. What, how and why?

Super string theory (sst) is currently the most exciting theoretical branch of physical science that is actively being pursued at a number of well-known centers of higher learning by eminent researchers. Extremely interesting facets of the fundamental science are being dealt with here. If ultimately found turning out successful, it would provide us with the much sought-after complete synthesis and unification of physics, the so-called theory of everything (toe). Such a theory would enable the basic building blocks of na-

ture to be identified and amalgamated into a common, simple, straightforward description with a beautiful, unified theory of all the forces of the universe. This new theory uses all the existing advances in physics and higher, intricate mathematics (Differential Geometry, Cohomology, ...). It has profound consequences for the entire science and, therefore, the whole human existence, interaction and progress. It is in the forefront of modern science appealing in the most subtle fashion to the professional scientists, mathematicians and philosophers alike.

There are quite a few possible directions that the theory might take in the future, perhaps in a great grand unified approach (ggua) to the entire field of physics and more. Let us wait and see.

### X Concluding remarks (10,15)

I referred to the Lord Krishna's unforgettable words insisting that He is the unique, unparalleled entity, the basic thread substratum, ever existed and to which everything else is attached or hung from, apart from His being the sole ever shining soul of all (2).

The two ends – smallest and the largest – in scale of the material world to which much of the modern science is attached somewhere, somehow seem to be closely knit together. In fact the mastery over one needs absolutely the complete understanding of the other thereby one necessitating the other in some peculiar ways. The idea of tying together and considering one as an intimate part or extension of the other is of intrinsic beauty, aesthetics and merit.

Quite certainly and clearly I perceive in the string of Gita and fundamental particles (or strings) a truly great potential of a worthy synthesis – a new complementarity principle, if you like.

Surely, it is essential for us to convince ourselves and realize that there are explicit, useful comparisons and connections between the ideas and concepts in both the vedic wisdom and novel discoveries and inventions of the modern sciences.

Separate from outside, but deep down we are all one!

Starting from the purely material plane we can reach the much –cherished spiritual goal, if only we carefully and most sincerely collaborate in this venture without any inhibition whatsoever. Towards this welcome end, let us all march on working hard and long enough so that we could achieve whatever we are searching for as the lifes' precious purpose, sooner than later.

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in contact. I place this small contribution in all humility with utmost respect at the divine, lotus feet of AMMA, in love and service.

Om Nama Shivaya

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