



Shri Basavaraj S. Bommai
Hon'ble Chief Minister
Government of Karnataka

VIJNANA VAHINI

July 01, 2022 to September 30, 2022



Dr. Ashwathnarayan C. N.
Hon'ble Minister for Higher Education, IT&BT, S&T,
Electronics and Skill Development, Livelihood,
Government of Karnataka

KARNATAKA SCIENCE AND TECHNOLOGY ACADEMY DEPARTMENT OF SCIENCE AND TECHNOLOGY, GOVERNMENT OF KARNATAKA



Prof. S. Ayyappan

FROM CHAIRMAN'S DESK

KSTA completed 17 years of its establishment on 5 September, with notable contributions to 'Science for Society' in the State. We would like to thank everyone associated with the Academy for their association and guidance over the years.

The Academy sponsored a National Conference on 'Science & Technology for Start ups' at the Siddaganga Institute of Technology, Tumakuru, during 19-21 July, 2022, drawing a large number of participants and formulating a road map on the subject. A three days' S&T Conference in Kannada was also sponsored at the Karnataka College, Bidar, during 14-16 September, 2022.

The Awards Ceremony, 2022 was organized at the Academy on 2nd August, 2022, inaugurated by Dr. Ashwath Narayan, C.N. Hon'ble Minister of Higher

Education, Electronics, IT BT Science & Technology, Skill Development, Entrepreneurship and Livelihood Departments, Government of Karnataka, as the Chief Guest. Prof. Ajay K. Sood, Principal Scientific Advisor to the Hon'ble Prime Minister graced the occasion and spoke on S&T strides and future possibilities. With four Lifetime Achievement Awards and 50 Fellowships, the Programme assumes special significance in the context of Azadi ka Amrut Mahotsav celebrations.

As in the previous quarters, KSTA sponsored and collaborated with several organisations in S&T programmes both at the Academy and in different locations, along with the publications disseminated across the State. The guidance and inputs received from the Members are gratefully acknowledged.

- S. Ayyappan

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KSTA AWARDS, FELLOWSHIPS AND ASSOCIATESHIP

Prof. C.N.R. Rao-KSTA Lifetime Achievement Award for the year 2022 and the KSTA Lifetime Achievement Award in STEAM communication in Kannada were presented on August 02, 2022. These awards carry a gold medal, cash prize and an honorary fellowship of the Academy.

Hon'ble Minister of Higher Education, Electronics, Information Technology, Biotechnology and Science and Technology, Skill Development, Entrepreneurship and Livelihoods, Government of Karnataka Dr. C. N. Ashwath Narayana honoured the selected scientists with the awards and fellowships. Prof. A. K Sood, Principal

Scientific Advisor to the Hon'ble PM graced the occasion as Chief Guest. Padma Shri Awardee & Chairman, KSTA Prof. S Ayyappan, Shri A. B. Basavaraju, IAS, Director (Technical), DST, Govt. of Karnataka and Dr. A M Ramesh, CEO, KSTA were present on the occasion.



Continued in Page 4 . . .

ADDRESS BY PROF. A. K. SOOD, PRINCIPAL SCIENTIFIC ADVISOR TO THE HON'BLE PRIME MINISTER OF INDIA AT THE AWARD FUNCTION 2022



Distinguished Fellows, awardees, ladies and gentleman. It is indeed a great pleasure for me, and indeed an honour for me, to be here this morning with all of you and be a part of this function to recognise the contributions which all of you have made to science and technology in general and also the growth of science and technology in the state of Karnataka.

. I have a new hat to wear and that is in Delhi and that is to advise Government of India and our Hon'ble Prime Minister on S&T policies and future technologies. Also, to coordinate with the science ministry and all the line ministries. So, this is a very unique position which has been created, which not only looks at the science ministry, which are 6 of them as you know in Government of India, but also all ministries where S&T is involved, be it Textile Industry, be it Civil Aviation, be it MOEF and so on. So, it's a very unique position to give inputs and also to see the bottlenecks or the gaps which are there and to put it in right place. It not only looks at all the issues which can be addressed, but also at the strategic sector where S&T intervention could be useful.

. We have two platforms in our office. One is the 'PM STIAK' (Science Technology Innovation Advisory Council to the Prime Minister) which has other external members and secretaries to government of India as invitees and also there is another very powerful body called and 'Empowered Technology Group (ETG)' which looks at the future technologies or the technologies that we are going to bringing it for the policy papers, for example, space policy which is being drafted right now and it is under discussion.

. under this office we have few missions which have been launched, like, 'waste to wealth' mission and few more and we are now looking at other missions which could be very much necessary and one such thing where Karnataka Government has also taken lead is the 'One Health' mission, which you might have read in the newspapers. So, Karnataka Government has already launched recently 'One Health' mission. But, this 'One Health' concept is not new. All of us have to appreciate. Various ministries have been looking at 'One Health' in the sense of taking the human health, the animal health, the wildlife health and environment together. All these things have to be looked at in totality and nothing has taught us better than the recent COVID experience. That is how things are getting from one domain to another and there are no boundaries here. So, this has been a very challenging thing and nobody can tells that the COVID will be the last pandemic we have suffered. There is no guarantee that next pandemic may or may not occur. We have to be ready for it. You know that when it started in 2020 January and March when it was declared as a pandemic. We were not ready. But, it is remarkable that all the communities, be it science, engineering, social science, all came together to handle the challenge

. Actually, I don't think many people know that how the corporates came together to really make a difference and many of the things were done through our office through strategic alliance. So, we brought the corporate sectors and all the labs here in Bangalore and other places. At the time we didn't even have the right testing chemicals. All that was done in a record time and the resources not only came from Government, but also some corporate sector which we really don't know much and lot of hospitals which came up in a record time. This is really the power of all the stakeholders coming together and owning it. Now, this need not have to be done only by a pandemic. But, we should really learn from that, and that's what we're trying to do. Learning

from the pandemic, what can we do to make sure that we all work together, along with the government intervention wherever policies are needed and wherever support is needed, the initial support our office has been given to many projects and so on. It's really a marvellous story of cooperation and delivery in the record time. Even the oxygen concentrators and so on and so many, actually the list is so big, it's amazing to me that in record time we could make it happen. So, this has also taught us now how to be ready, if at all there is a future pandemic. We have been now talking to various concerned people on what are the gaps in our readiness.

So, 'One Health', let me again say it's not a new concept, it is a concept which is there for the last 15 - 20 years or even more years and many ministries are doing it. Ministry of Health under ICMR, Department of Biotechnology, MOEF, many of them are doing in their own domain, because, you know that you have that zoonotic diseases coming from Animal Kingdom. But that's not all. There can be other things also and now you are seeing Monkeypox. Before you thought everything is good and we started celebrating the freedom, we have monkeypox. But, I am not sure this is the last thing which we hear, there could be others also. So, environmental survey to really detect this in a scientific manner, is the need of hour. In 'One Health' mission, we are trying to identify and putting a team together of various interested people who can make an input in this and then we will also bring the state governments together and Karnataka Government and one more state have already announced their keen interest and they have launched it.

Second thing, which again Karnataka has a role to play is the startup. Startup is the hot buzz. But what we are trying to see is that 'Deeptech Startup'. where the startup is based on deep technology. Now that unfortunately, I should say, let me be very honest here, that we have much, much, much more to do. So, our startups have come up, which is a huge number 67,000 or 70,000 and we have about 50 Unicorns. All that is a good to be very proud of. But, question is if it is all service oriented, how long can we sustain that? Because, if country has to be a leader we need to lead in 'Deeptech startups'. So, now we are again trying to see what are the gaps?when you have a 'Deeptech startup', they will need very sophisticated equipments, facilities. You know, you can't be setting up all that in your startup company, because that is not feasible financially and even otherwise. With our office Initiative, CeNS under IISc, there is a portal called iSTEM, we have put a platform, the dashboard of the high-end equipments which have been bought under various funding agencies. The investigator and the institutes are willing to share the facilities with others. More than 25,000 equipments are already present there. In this platform you can book the slot to work of course with nominal charges, because equipments have to be maintained. So, this is a very unique thing for 'Deeptech startups'.

Another step towards 'Deeptech startup' is the database for scientific, engineering, medical research papers on one platform. Things are happening in small ways in pockets and now we are creating a big platform again with IISc's help. I am glad that things are moving to almost a final stage to launch it very soon and this again will be a very very big change. So, we are trying to see all the data will be on this STI portal and that will give another boost to this 'Deeptech startup' and also the whole entire STI ecosystem in the country.

. you have to think, under the Academy, what are the future technologies where you want to involve. So, you have to really brainstorm, where you can really have a very high-quality human resource through our education system which will become relevant, let's say in 5 years' time. As the Academy, as a think tank, you have to see how to be ready. So, this is where you need to brainstorm among your fellows.

.one technology which you been hearing is quantum technologies. Quantum is the name of the game. Are we ready for it? Honest answer is much much more has to be done. Suppose you want to do quantum communication, you don't have people. So, you have to prepare right now and this is a technology which will not wait for us. There is a complete agreement that the future will have it. You have to think what can you do as Academy to prepare people? I'm glad that Karnataka Government has set apart some seed money. I think the project is with IISc. It's very small starting point. But, you have to really see how to take it to colleges, not only the top institutes. You have enormous number of engineering colleges. You have huge young people. How can we do that? There will be a huge market, huge intellectual space for quantum. Academy think tank should really see how you can put yourself above others.

Another thing is Metaverse. Metaverse is a combination of many things. You have the augmented reality, you have the virtual reality, you have the block chain and IoT. All these put together, you can really create a huge wonder, which I recently had a demonstration, where you create your digital twin, for example. Question is how

can you leverage that for your domain, your industry and so on. Now, It's not something like a science fiction. 20 years back it was a science fiction. South Korea has already launched a Seoul digital world.

At least, I can see these two areas, which are very much in their infancy. Can Academy do something to put its resources together, intellectual resources more than anything else, and really take youngsters on this futuristic path, I'm sure there will be many other areas. I'm not the one to tell you about biological science because, I don't come from that domain. This is where the strength of Academy lies to bring all of you together and my hope is that Karnataka will continue to lead and show the path of S&T Power to the entire country and the world. It's no longer just a country. It's the Global village. So, all that is possible and that's where Academy, I am sure, will play a key role. So, thank you once again for having me here and I appreciate your patience. Thank you.

KSTA AWARDS, FELLOWSHIPS AND ASSOCIATESHIP

PROF. CNR RAO LIFETIME ACHIEVEMENT AWARD IN STEAM

Two senior scientists/technologist have been awarded with Prof. C. N. R. Rao-KSTA Lifetime Achievement Award for the year 2022 in recognition of their unique contributions in the field of science/technology/engineering/agriculture/medicine



Dr. C. A. Viraktamath
Retired Emeritus Professor
University of Agricultural Sciences, Bengaluru



Dr. T. Shivanandappa
CSIR Emiretus Professor
University of Mysore, Mysuru

KSTA LIFETIME ACHIEVEMENT AWARD FOR STEAM COMMUNICATION IN KANNADA

Two renowned communicators were awarded with KSTA Lifetime Achievement Award for STEM communication in Kannada for the year 2022 in recognition of the outstanding contributions made in STEAM communication in Kannada



Dr. N. Someswara
Medical Doctor & Renowned Quiz Master,
Bengaluru



Dr. K. V. Rao
Director, Pilikula Regional Science Center,
Mangaluru

KSTA FELLOWSHIPS AND ASSOCIATESHIP

FELLOWSHIPS (FKSTA)

Based on recognizable individual merit and contribution to STEAM and recommendations of KSTA-Awards and Fellowships Selection Committee (AFSC), 50 fellowships were conferred during the year 2022.

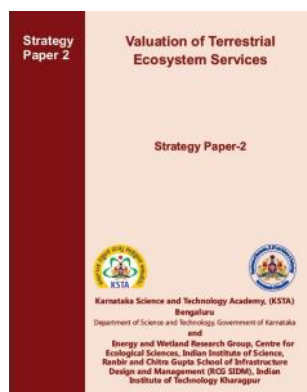
Sl. No.	Name	Sl. No.	Name	Sl. No.	Name
1	Prof. A. K. Sood	18	Dr. Kurpad A.V.	35	Mr. Siddique M.Z.
2	Dr. Abraham Varghese	19	Dr. Lalitha R. Gowda	36	Dr. Someswara N.
3	Prof. Adimurthi A.	20	Prof. Manohar V. Kulkarni	37	Dr. Sridevi A. Singh
4	Prof. Amruthesh K.N.	21	Prof. Murthy K.N.B.	38	Dr. Sreekanteswara Swamy S.G.
5	Dr. Arun C. Inamadar	22	Dr. N. K. S.Gowda	39	Dr. Srikrishna Isloor
6	Prof. Bagyaraj D.J.	23	Prof. Naduvinamane N.B.	40	Dr. Subarna Roy
7	Prof. Balasubramanian A.	24	Prof. Navakanta Bhat	41	Dr. Sudarshan H.
8	Dr. Bhaskar N.	25	Dr. Navalgund R. R.	42	Prof. Thimme Gowda B.
9	Dr. C. L. L. Gowda	26	Dr. Prasad C.S.	43	Prof. Uma Shaanker R.
10	Prof. Dandin S.B.	27	Prof. Rabinal M.K.	44	Prof. V. Ravishankar Rai
11	Prof. H.R. Ramakrishna Rao	28	Dr. Rajani M.B.	45	Prof. Veerappa Gowda G.D.
12	Prof. Honnappagol S.S.	29	Dr. Ramachandra T.V.	46	Prof. Venkataraman A.
13	Prof. Indires K.M.	30	Prof. Ramesh S. R.	47	Prof. Vijayalakshmi Dega
14	Prof. Jagadeesh G.	31	Prof. Rangaswamy B.E.	48	Prof. Viraktamath C. A.
15	Prof. Jagadish R. Tonannavar	32	Prof. Revanasiddappa H.	49	Dr. Vishal Rao
16	Dr. Jali M.V.	33	Prof. Roopa K.M.	50	Dr. Viswanath S.
17	Dr. K.V. Rao	34	Prof. Shankar K.M.		

ASSOCIATES

Academics/Researchers/Teachers/Practitioners in any branch of Science, Technology, Engineering, Agriculture and Medicine, working or retired from Educational/Research and related organisations including Corporate, are being admitted as associates. Individuals who are desirous of becoming Associates of KSTA may do so by paying a fee of Rs. 1,000/- (Rupees One thousand only), and submitting a duly filled application form available in the KSTA website throughout the year. Till September 2022, 91 applicants were admitted as Associates.

PUBLICATIONS

STRATEGY PAPER-2 : VALUATION OF TERRESTRIAL ECOSYSTEM



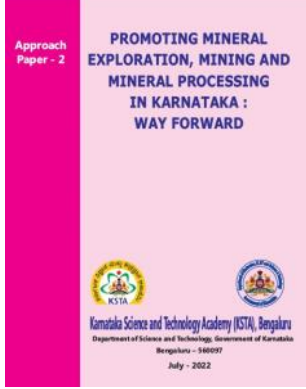
The valuation of ecosystem services (VES) provides an unbiased framework to value unaccounted ecosystem benefits and also helps in developing meaningful policy interventions. In this perspective, KSTA has brought out this Strategy



Paper focusing on "Valuation of Terrestrial Ecosystem Services", and is an effort of a group of eminent scientists led by Prof. T.V. Ramachandra, Coordinator, Energy and Wetlands Research Group,

Centre for Ecological Sciences [CES], IISc. This exercise in other states will undoubtedly play a vital role in conservation, planning and ecosystem-based management in India.

APPROACH PAPER - 2: PROMOTING MINERAL EXPLORATION, MINING AND MINERAL PROCESSING IN KARNATAKA : WAY FORWARD

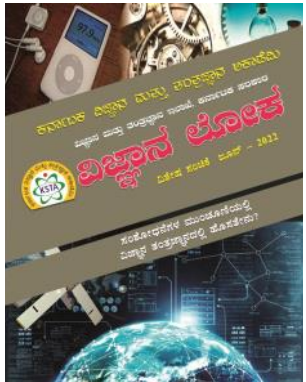


Karnataka state, which is rich in its resource potential for producing several metals and minerals, from the Pre-British era, is one of the biggest industrial hubs in the country. KSTA has brought out this Approach Paper to Promote Mineral Exploration, Mining, and Mineral Processing in Karnataka, keeping in mind the existing gaps, challenges and opportunities. This document is



prepared by an expert group led by Dr. Prabhakar Sangurmath, Former Executive Director & Member, Board of Director, Hutti Gold Mines Co. Ltd.

VIJNANA LOKA SPECIAL ISSUE ON FRONTIERS OF SCIENCE AND TECHNOLOGY [ಸಂಶೋಧನೆಗಳ ಮುಂಚೂಣಿಯಲ್ಲಿ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನದಲ್ಲಿ ಹೊಸತೇನು?]

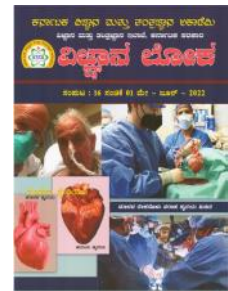
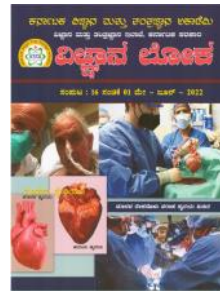


Brought out a special issue on Frontiers of Science and Technology. This special issue comprises of 26 articles on frontiers of science and technology written by renowned science writers / researches in Kannada



VIJNANA LOKA – BIMONTHLY MAGAZINE

Brought out July-Aug and Sep-Oct issues of *Vijnana Loka* and sent to subscribers including pre-university and science degree colleges, science centres, libraries and other organizations across the state. Also available on KSTA website - <https://kstacademy.in> Interested may fill the prescribed application form available on the website



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CRUISING THROUGH THE PROGRESS OF BIOLOGICAL SCIENCES



Prof. S. K. Saidapur

Unlike in physical sciences, the progress in biological sciences was slow almost till the end of 19th century or so. For making meaningful strides, biologists needed tools and techniques so that they could probe the interior of the body, tissues and cells and finally the molecular organization and working of organisms both at organismic and molecular levels. However, the instruments and techniques are typically built by physicists, engineers and chemists/biochemists. Biologists use available techniques in trying to understand the working of organisms at various levels and unravel the mysteries of life. For instance, with the building of simple microscopes, it was possible to see the organisms invisible to the human eye. Once such organisms were detected, it necessitated development of microscopes of various types (compound, florescence, electron, confocal etc.) with higher magnification as well as high resolution. The needed tools and techniques became available around the 19th century and these heralded unstoppable progresses in biology. This article is to cruise through a few major highlights of developments in biology that are of *fundamental* and great importance.

Firstly, making some considered sense of the vast biodiversity was crucial. This included a systematic way of organizing the vast biodiversity in a systematic way (grouping related organisms), naming them, establishing relationships between different groups of animals and plants, as well as understanding the hierarchy within plant and animal kingdoms; all this became possible through the work of Carl Linnaeus (1707-1778) who proposed the system of binomial nomenclature (name of the genus followed by species- ex: *Homo sapiens*). He is regarded as the father of Taxonomy. In fact, orderly arrangement (identification, classification and documentation) of biodiversity became largely possible due to

Linnaeus. Prior to 19th century, in general, biological studies were largely limited to describing fossils, morphology, anatomy, physiology, development and so on.

An important breakthrough was the proposal of a generalized theory called "*Cell Theory*" (1839) which stated that the cells are the fundamental units of all life forms. It is the result of several workers like: Robert Hooke (1665); T. Schwann & M. J. Schleiden (1839). Soon thereafter, Rudolf Virchow (1865) showed that cell arise from preexisting cells only (by cell division) and not *de-novo*.

Soon after the cell theory came the "*Theory of Evolution by Natural Selection*" put forth by Charles Darwin and Russell Wallace in the year 1858. However, it took almost a century to appreciate the importance of this theory. Now, evolution is considered a core theme in biology. It connects all streams of biology and attempts to explain most biological phenomena in a logical way. So much so, the ideas from evolutionary biology have greatly aided in our understanding of animal behaviors (microbes to man, and, plants), survival strategies and so on. In addition, ideas from evolutionary biology have cogently contributed to the emergence of new branches like the *Evolutionary Medicine*, *Evolutionary Psychiatry*, *Darwinian Agriculture*, and *Darwinian Fisheries*.



R. Hooke



T. Schwann



M. J. Schleiden



R. Virchow



Carl Linnaeus



Charles Darwin and Russell Wallace

Another major breakthrough in biology was elucidation of the principles of inheritance and as such the *Discovery of Genetics* by Gregor Johann Mendel (1865) who showed the existence of *dominant* and *recessive* traits (now called *genes*) that do not blend with each other. Since the late 20th century genetics has made advances by leaps and bounds leading to a new branch, termed, *Epigenetics*. Mendel is regarded as the father of Genetics.



Gregor Johann Mendel

The elucidation of the structure of DNA (1953) by James Watson, Francis Crick and Maurice Wilkins (who received Nobel Prize in 1962) and subsequent elucidation of principles of coding and transmission of genetic information by Har Gobind Khorana, Marshall W Nirenberg, and Robert W Holley (who received Nobel Prize in 1968) led to the birth of molecular biology. Knowledge of relationship between DNA, RNA and protein eventually led to developing techniques to amplify synthetic genes. Later, Kary Mullis developed technique of polymerase chain reaction (PCR) using a thermo-stable DNA polymerase for which he received the Nobel Prize (1993) in Chemistry.



James Watson



Francis Crick



Har Gobind Khorana

In recent times, biological sciences have advanced enormously due to inputs from all other branches of sciences and keen interest in unravelling the secrets of life. The various breakthroughs in genetics and epigenetics, molecular biology, drug designing and biotechnology as well as in the emergence of novel

frontier areas of research like *Systems Biology*, *Computational Biology*, *Bioinformatics*, *In Silico Biology*, *Genome Editing* and *Synthetic Biology* are the products of multidisciplinary researches. Modern Biology is thus very complex. Therefore, any deeper understanding of biology and its pursuit now requires sound knowledge of chemistry, physics, maths, statistics, computer science & several software, and use of artificial intelligence (AI). The AI has recently predicted the structures of nearly all known proteins (~350,000). Further, the DeepMind Company based in London using AI has predicted structures of nearly 200 million proteins- from bacteria to man ('The Protein Universe'). Scientists are now able to edit genes to add or remove the desired ones.

Jennifer Doudna and Emmanuelle Charpentier who developed the CRISPR Cas-9 technology for gene editing received Nobel Prize in Chemistry (2020). Genome editing using CRISPR-Cas-9 technology enables removing / adding



Jennifer Doudna & Emmanuelle Charpentier

desired genes in organisms. It has given new hopes of improving the lives of man (ex: cure for cancer and other diseases and crop improvements etc.). In short, deeper insights in molecular biology, AI, computational biology and, development of diverse techniques and their applications have given unimaginable hopes in medicine, agriculture and other areas. Besides, these developments have marked not only the onset of a 'Digital Era in Biology' but also endorse the view that 21st Century belongs to Biology.

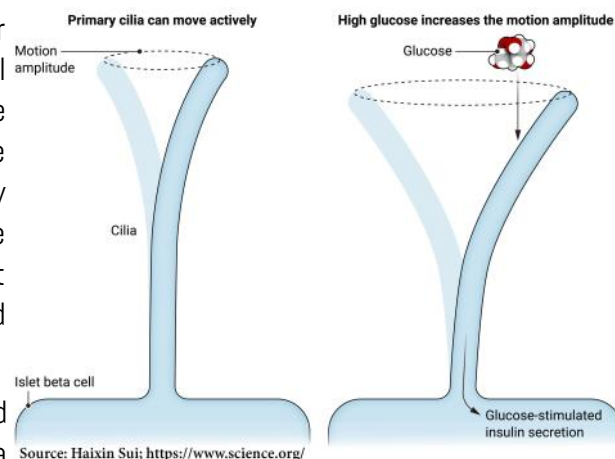
- Prof. S. K. Saidapur
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Member, KSTA
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A LEAD TO NEW UNDERSTANDING OF DIABETES

We all know that eukaryotic cilia, which are slender hair-like projections, are classified into motile and nonmotile types. Primary cilia of pancreas, which are believed to be nonmotile passive sensors, mediate cellular interactions with the surrounding environment and maintain tissue homeostasis. The studies (F. Volta *et al.*, 2019 and C. T. Wu *et al.*, 2021) confirm the involvement of primary cilia in pancreatic β cells in glucose homeostasis. But their functional roles and the mechanisms of actions are unclear. Recent study conducted by Cho *et al.*, 2022 shows that primary cilia in human and mouse pancreatic islets exhibit movement that is required for glucose-dependent insulin secretion. They also link the motility of the β cells cilia to glucose

sensing, which is critical in the physiology of blood sugar level regulation. Inhibition of cilia motion blocks β cell calcium influx and insulin secretion. Human β cells have enriched ciliary gene expression, and motile cilia genes are altered in type 2 diabetes. Their findings redefine primary cilia as dynamic structures having both sensory and motile function and establish that pancreatic islet cilia movement plays a regulatory role in insulin secretion. This insight could lead to new understanding of diabetes.

The researchers used live-cell imaging of both human and mouse to characterize the motility of pancreatic β cell cilia and its dependence on glucose. The study suggests that the motility of the β cell primary cilia is affected by glucose concentration and is associated with the Ca^{2+} response, which is critical to insulin secretion. On the basis of their study, they concluded that the cilia motility is an essential aspect of β cell function. This concept is confirmed by the observation that the cilia motility genes are enriched in human β cells and their expression was altered in type 2 diabetes (T2D), a disorder often characterized by insulin secretion. The demonstration of motility gene enrichment in β cells across the human age group strongly suggests a role of islet cilia motility on human health. This study raises the possibility that cilia dysmotility may be a pathway to islet dysfunction and offers a new therapeutic target for human metabolic diseases. They opined that the study presented with a limited bioinformatics analyses and suggest a more comprehensive study of cilia gene expression in human islets to compare disease-correlated changes across multiple T2D datasets. This study opens up a new opportunity for researchers to understand the primary cilium motility and its potential roles in the sensory functions of other cell types also.



Dr. Anand R.

Senior Scientific Officer, KSTA
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MOU AND COLLABORATIONS

During July-September 2021, MOU with the following 02 organisations/institutions were signed and till date 55 MOUs with organisations/institutions were signed with the following purpose and scope:

- Inculcating scientific temper across civil society through science communication
- Facilitating technology dissemination through Academia-Farm-Industry interface, with a focus on rural areas
- Fostering innovations and entrepreneurship for societal benefits
- Organising conferences & outreach programmes
- Capacity building in frontier areas of Science & Technology
- Any other aspects with mutual consent

Sl. No.	Organisations/Institutions	Date of MOU
1	Poornaprajna Institute of Science and Research (PPISR), Bengaluru	08.07.2022
2	Don Bosco Institute of Technology, Bengaluru	05.07.2022

PROGRAMS CARRIED OUT DURING SECOND QUARTER (JULY - SEPTEMBER 2022)**SCIENCE AND TECHNOLOGY ANNUAL CONFERENCE**

KSTA and Siddaganga Institute of Technology, Tumakuru jointly organized a three day National Conference on "Science & Technology for Start-ups" during July 19-21, 2022. The conference was inaugurated by Shri Jyothi Ganesh, Member of Legislative Assembly, Tumakuru, with an introductory address from Prof. S. Ayyappa, Padma Shri Awardee, Chairman, KSTA, Bengaluru and the key note address was delivered by Dr. K.P.J. Reddy, Former Professor, Department of Aerospace, IISc, Bengaluru. Sri T.K.Nanjundappa, Secretary, SSES presided over the inaugural function.

Dr. A.M.Ramesh, Chief Executive Officer, KSTA, Dr. Shivakumaraiah, CEO, SIT, Dr. S.V.Dinesh, Principal, SIT and Dr. C.P Lohith, Convener NCSTS 2022, Faculty Coordinator,

Siddaganga TBI were present during the inauguration.

The three-day event witnessed a galaxy of experts from scientific community, policy makers, Technology Experts, Innovators, successful and budding young entrepreneurs sharing their knowledge in the conference. More than 500 delegates consisting of students, research scholars, faculties, entrepreneurs from the state of Karnataka and else where attended the event. As part of the event, 91 scientific papers were presented in the form of posters in various areas like Physical Sciences & Mathematical Sciences, Chemical Sciences, Engineering & Technology and multi disciplinary science.

**SCIENCE AND TECHNOLOGY CONFERENCE IN KANNADA**

Fourth Science and Technology Conference in Kannada was organized in Bidar in association with Karnatak Arts, Science & Commerce College during September 14-16, 2022. Invited talks by scientists, leading science writers and communicators were organized. In addition, apart from poster presentation were made by research scholars in Kannada. The conference was inaugurated by Prof. H. A. Rajasab, Former Vice Chancellor, Tumkur University/ Member, KSTA. Dr. Suresh Jangamashetty, Chairman, Department

of Electrical and Electronics, Basaveswara Engineering College, Bagalakote graced the occasion, while the inaugural session was preside over by Shri Basavaraj Jabashetty, Chairman, Karnataka National Education Institute, Bidar. Around 500 participants from Kalyana Karnataka region attended the conference and 170 posters were presented during the conference.



SKILL VIGYAN IN BIOTECHNOLOGY

KSTA-DBT-Skill Vigyan Program in Biotechnology is a 15 days Faculty Training Program (FTP) for the pre-university/UG/PG teaching faculty and mid-career scientists of various colleges/universities/educational institutes from Karnataka State to gain theoretical as well as practical knowledge in new trends in biotechnology with the funding support of the Department of Biotechnology, Govt. of India through the Karnataka Innovation and Technology Services (KITS), Dept. of Electronics, Information Technology & Biotechnology, Science and Technology, Govt. of Karnataka.

KSTA has successfully conducted the FTP program on "Skill Vigyan in Biotechnology" on a hybrid mode for 2 weeks [one week online and one week offline] at KSTA premises for about 25 biology lectures of various colleges/universities/educational institutes from the state. Resource Experts from the renowned academic and research

institutes were invited to deliver distinguished talks along with hands-on training. Exposure visits to different R&D laboratories and institutions in and around Bengaluru was also arranged.



DIGITAL CONTENT GENERATION

Digital learning contents are being developed for the high school students in Physics, Chemistry, Mathematics and Biology as per the Karnataka Secondary Education Examination Board (KSEEB) syllabus in Kannada and are being disseminated through DVD to the selected Government High Schools in backward taluks across the State. Till date, DVDs comprising of 70 lecture/experiments were sent to 400 Schools. This Program is supported by KSTePS

WEBINAR PROGRAMS

During July - September 2022, following 5 programs related to frontier areas of science and technology were conducted in association with research institutes/ science forum/ educational organizations.

Sl. No.	Date	Topic	Association	No. of Participants
1	August 22 -26, 2022	Hydro-Geological Engineering	JNNCE Shivamogga	105
2	September 9, 2022	James Webb Space Telescope	Sheshadripuram First Grade College, Bengaluru	115
3	September 18, 2022	2nd Virtual National Conference on "Space Science and Technology for School Students"	ISIE Ahmadabad, People Science Forum, KRVP, Mysuru and Space Geek	123
4	September 21-23, 2022	62nd Annual International Conference - "Microbes and Society: Current Trends and Future Prospects"	Association of Microbiologists of Indian and University of Mysore, Mysuru	1200 (registered)
5	September 23-25, 2022	Teachers Training Program	-	69



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SCIENCE TALENT SEARCH PROGRAM FOR PRE-UNIVERSITY STUDENTS

KSAT, in association with KSTePS, has organized Science Talent Search Program for Pre-University Students. In this program, 10 meritorious PU students from each district, totaling to 320 students from the State were selected based on merit. At the end of each lecture, students are being asked to answer few questions based on the lecture two best answers were given cash prize. During July - September 2022, 60 online talks by eminent scientists in physics, chemistry, biology, engineering, and agricultural sciences were organized and around 3600 students are benefited by this program.

Upcoming programs in FY 2022-23

Innovation Award for UG, PG and General Public: Prof. U. R. Rao award for PG students and Dr. S. K. Shivakumar award for UG students. The Award carry a cash prize of Rs 10,000 and a certificate. The last date for submission is October 31, 2022. For further details visit KSTA website: kstacademy.in.

Best Book Award in Science, Technology, Agriculture, & Medicine: In order to encourage publication of Kannada books in the field of agriculture, science, technology and medicine, KSTA has been providing best book award for the selected books once in two years. Authors may submit 04 copies of books published during January, 2021 to December 2022 for the award. The last date for submission is January 04, 2022. For further details visit KSTA website.

Vijnana Loka - Bimonthly Magazine: During 3rd & 4th quarter of FY 2022-'23, three issues will be published and posted to pre-university and science degree colleges, science centres, libraries and other organizations across the state. The subscription rates: Individual - Rs. 300 (yearly) & Institutional - Rs. 500 (yearly).

Science Communication and Science Popularization: Science communication & popularisation workshops will be conducted in KSTA.

Digital Content Generation, Production of Science Capsules, Short Feature Films /Clippings : Development of digital information in frontier areas of science and technology. Production of teaching and learning resources and distribution of the same to educational institutions in the backward areas through DVD/CD.

Other Programs

Policy, Strategy, Approach and Status Papers; Membership and Fellowship; Collaborative programs & MOU

Note: Depending upon the availability of funds and decisions of EC, above programs will be implemented.



SCIENCE & TECHNOLOGY FOR ALL

KSTA, a Unit of the Department of Science and Technology, Government of Karnataka, established on 5th September, 2005, has been mandated for science promotion and popularisation in the State. KSTA has the Vision of 'Nurturing and Enabling Science & Technology for All' and Mission of 'Playing a pivotal role in Science promotion, Technology dissemination and fostering Innovations for Societal welfare'. The Objectives of the KSTA are to inculcate scientific temper across the civil society through science communication, particularly in Kannada; facilitate technology dissemination through Academia-Farm-Industry interface, with a focus on rural areas; foster Innovations & Entrepreneurship for Societal benefits; recognise talents and contributions through Awards; organise Conferences & Outreach programmes; serve as Resource Centre for Capacity building in frontier areas of Science & Technology; and act as a Science, Technology & Innovation Policy (STI) Advisory Body for the State.

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