

33<sup>rd</sup> Anniversary Issue

# Dream

## 2047

OCTOBER 2022

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Narottam Sahoo

Shahid Rasool

Kollegala Sharma

# Science & Technology For All

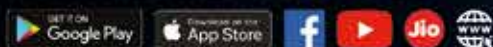


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# Thirty-Three and Counting...

**Dr Nakul Parashar**

Science & technology are for all. Thus, they are expected to reach all. But how does this happen? For ages, science & technology communication has been an integral part of the science & technology ecosystem. When wired & non-wired technology for communication was not advanced as it is today, science & technology communication was done through whatever available media then. Print media, theatre, films, documentaries and radio were used to explain the new frontiers of science and technology to the world. While this was done, it was noticed that those complexities of science & technology served the masses were not in a very-easily understandable way. This made interesting intricacies of science & technology dry and drab for the masses. Yet, society comprises all. Hence, to cover all, it was essential to making science communication more interesting and more popular.

However, people realised that to make science & technology more popular, incidents of dilution of scientific facts also started. While all of this was picking up, it was felt that outreach was also an important aspect. As a result,

an organisation with a mandate to spread science & technology communication, popularisation and its extension (SCoPE) called Vigyan Prasar was born on October 11th, 1989 as an autonomous organisation of the Department of Science & Technology, Government of India.

Books and print publishing have always been a hallmark of an organisation's outreach activities. Vigyan Prasar, for that matter, stands tall with more than 300 titles of original writing in Hindi & English. Besides Hindi & English, Vigyan Prasar has published books in more than twelve other Indian languages. On the periodical side, Vigyan Prasar continues to publish monthly magazines in more than fifteen Indian languages in a regular manner. This way, through periodicals and non-periodicals, Vigyan Prasar has reached every corner of the country.

Over the past two decades, we have witnessed changes in the video world. Technologies of filmmaking and its telecast-screening have undergone a significant transformation. OTT (Over-the-top) has allowed the user to watch a film wherever, whenever, and at whatever comfort. Vigyan

Prasar's flagship contribution to the society called IndiaScience. in (India's S&T OTT Channel), with more than 4000 films and counting, and continues to be one of the most acclaimed ones.

The list of deliverables of Vigyan Prasar's contribution is long, and with every passing day, it is growing. Candidly, there's a new one practically every second day. Amidst this, Vigyan Prasar realises the importance of developing more and more new science communicators, filmmakers, storytellers, writers & authors, and ground-level workers. Thus, to get this workforce ready, Vigyan Prasar, on its thirty-third annual day, pledges to ensure that a series of popular science writing, science filmmaking, and science-through-theatre training workshops will be organised.

Once again, on this thirty-third annual day of Vigyan Prasar, on behalf of the entire team of Vigyan Prasar spread out all over the country through its partners for every Indian language, I wish you a happy anniversary and hope many more to come. •



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# Empowering Science Communication

Pallava Bagla

India's deep strengths in indigenous research and development have helped the country reach new heights. India's progress in the last seventy-five years after gaining Independence has no doubt been remarkable. Going forward, if India has to become a developed country then local science and technology will be critical to attaining that dream orbit. In that journey, science communicators will play an important role, give them more power.

India's progress in the next twenty-five years as the country goes to celebrate the centenary of Independence from British Raj will no doubt be powered by innovation, start-ups, and the strengthening of the knowledge society. But there is one undersung but underlying fact that needs to be bolstered, and that is the role of science communication.

Prime Minister Narendra Modi, in his speech at the Science Conclave held on Sept 10, 2022 emphasised "when we celebrate art, we also inspire and create more new artists. When we celebrate sports, we inspire and create new players as well. Similarly, when we celebrate the achievements of our scientists, science becomes a natural part of our society and a part of the culture. Therefore, today I urge all the people who have come from all the states to celebrate and glorify the achievements of the scientists



of our country." A good point made by the visionary Prime Minister.

One organisation that has been celebrating India's science and scientists is no doubt **Vigyan Prasara**, which has been in existence since 1989. At last count, the only arm of the government dedicated to taking science to the masses had produced over 350 books, over 2,650 hours of

videos; over 3,700 hours of audio programs, even the booming Indian private media industry can't boast of such numbers for the popularisation of science. No doubt the country is richer with quality scientific material being made available in so many of our regional languages. These are quality science products made keeping the lay person so that they could be understood by all.

I have seen **Vigyan Prasara** grow from the days when its founder and head Dr Narender K. Sehgal, laboured to make it an autonomous arm of the Department of Science and Technology to bring science closer to India's ever-knowledge-hungry people. Now the agency has been working with newfound vigour in taking complexities of S&T to all corners of India.

**Department of Science and Technology (DST) acts as a nodal agency to support, catalyse, and coordinate celebration of the National Science Day pan India.**



The organisation came into its total activity and bloomed during the COVID-19 pandemic and ensured that the best scientific facts were conveyed to Indians in a language they could comprehend.

In fact, it was during the pandemic when Vigyan Prasar approached me to make on-the-ground reports celebrating the work done by India's vast scientific community for its flagship product, The India Science Channel. Through the course of over 18

months, thanks to a hardworking team, we made 75 half-hour documentaries as part of the series *Life in Science With Pallava Bagla*, a hugely applauded one-of-a-kind effort. The show also bagged the coveted Red Ink Award for its maiden documentary on the country's unique mobile COVID-19 testing laboratory. The India Science channel, led by a handful of people, delivered remarkable work during the pandemic.

I must add here that after I was

assigned the task of spearheading these documentaries, I was given a free hand to choose the subjects and topics that needed to be covered. Thanks to the team from **Vigyan Prasar** and the production house IMAK News and Entertainment Private Limited, we made eight documentaries on the theme *Science in the Kashmir Himalayas*. This was completed at a point when COVID-19 was still raging, and not many wanted to step out of their homes, let alone visit Kashmir for weeks on work.

Indian scientists are a particularly sensitive lot, if they are not feted and applauded, the enthusiasm can wane quickly and as Mr Modi seeks, we need to celebrate 'Indian scientists' so that more of them can bloom in the *Amrit Kaal*. Just imagine what would have been our situation had the Indian scientific community not delivered solutions to fight the pandemic.

Now in this *Amrit Kaal* or the next twenty-five years, the role of the Indian science communicator is going to be even more crucial as many-many complexities of S&T need to be explained to Indians.

An empowered India which aspires to be a *Vishwa Guru* once again needs to strengthen the hands of science communicators since a 'New India' will have its foundations deeply rooted in local research and development. Science communication is the keystone as India marches into the proper new orbit in the comity of nations as a developed nation. *Mainstream Anusandhan se Samadhan*. •

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**Pallava Bagla** is science communicator for more than four decades and has been widely feted with national and international awards.

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# Building Public Trust in Science

Dr. Felix Bast

Vigyan Prasar was established as an autonomous institute under the Department of Science and Technology, Government of India with the chief objective of science popularization in India. Through various print and electronic media channels, it remains the forerunner of science communication in the country. It is an asset to the people of India for fostering the public value of science. Besides Vigyan Prasar, the country's only other central government institute focused on science communication is CSIR-National Institute of Science Communication and Policy Research (NIScPR), established much later in 2002.

My experience with Vigyan Prasar began with a series of popular science articles published in Dream2047- Vigyan Prasar's popular science magazine. Dream2047 has a unique and original format; the magazine is bilingual with a Hindi cover and pages flipping on one side, while exact contents are translated into English on the reverse side. This format ensures wider reach to the audience with the diverse linguistic background here in India, making it useful even to an international audience. While I do not have information on its readership, a large number of email appreciations I receive after almost every article of mine that gets published in this magazine is





**Large number of email appreciations I receive after almost every article of mine that gets published in this magazine is indicative of the massive societal impact of this publication.**

indicative of the massive societal impact of this publication. In 2018 I entered into a book project contract with Vigyan Prasar for publishing my memoirs from Indian Antarctic Mission. The book "Voyage to Antarctica" was published in 2019 in a record time; the excellent editorial support I received from Vigyan Prasar was genuinely exemplary. Thanks to the efforts of Vigyan Prasar's marketing team, the book became a bestseller in India in such a short time. The work continues to be one of the top-selling books of Vigyan Prasar.

I also worked with Vigyan Prasar on two major audiovisual science

communication projects. Many of my independently produced videos on science literacy have been hosted at the DST-IndiaScience portal, which Vigyan Prasar maintains. The second project is currently being undertaken to develop a ten-episode video documentary series entitled "Mysteries in Science." Each episode of the series covers ten significant mysteries of the field concerned, and the episodes cover topics from all spheres of science and technology. The support I received from Vigyan Prasar during the execution of this project was fabulous, with their constructive comments and criticisms

significantly improving the content and content delivery in the program. The series is expected to become available and telecast via Prasar Bharati in early 2023.

At this juncture of concluding the year-long golden jubilee celebrations, I envision continuing to work closely with Vigyan Prasar for science communication in the country and beyond. My best wishes to this wonderful organization! •

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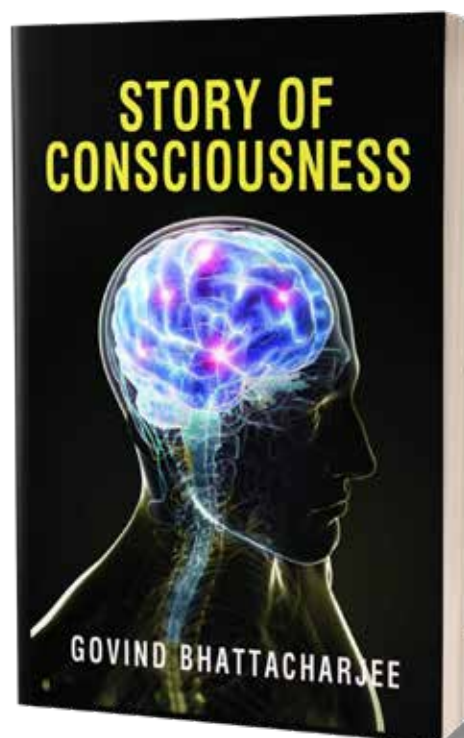
# The Light of Vigyan Prasar

**Dr Govind Bhattacharjee**

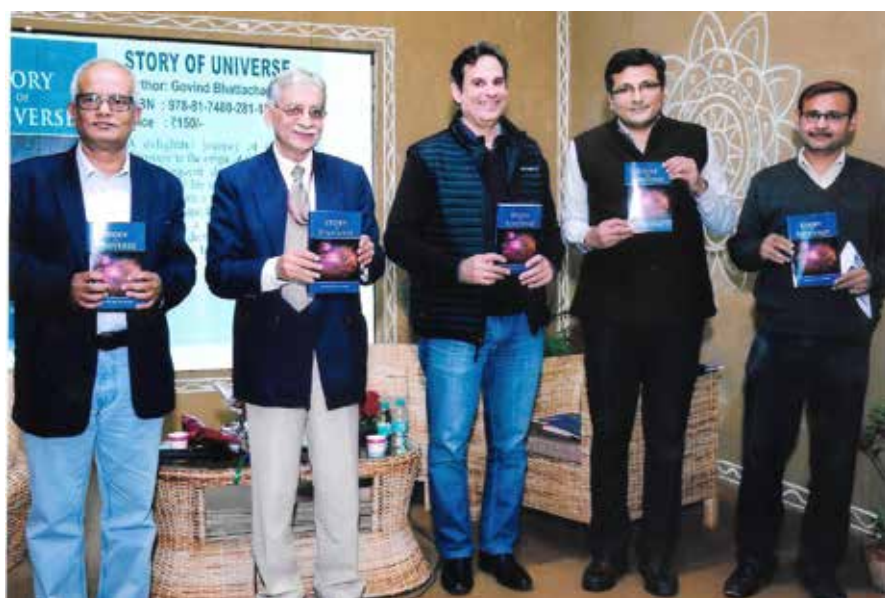
Some years ago, I had received an interesting mail after one of my articles was published as a cover story in Dream 2047, the popular monthly journal of Vigyan Prasar. The mail was written by a Class-VIII student from a remote town in Assam. She had read the article in a copy of the journal that was available in her school library but did not understand it fully. After discussing with her friends and teacher, she decided to write to me that she had lots of questions on that article and whether I would mind addressing them. That began a string of conversations over the next few weeks between us, at the end of which her doubts were apparently cleared. From her, I got to know that in her school, Dream 2047 was always in high demand among both students as well as

teachers because that was the only science journal available in her town – indeed very few science journals are published in the entire country even now whereas news journals that propagate nothing but truthiness proliferate like mushrooms. The little girl wondered why Dream 2047 had so few pages and contained so few articles, and wished it to expand to include many more articles that would inform her about the working and wonders of science.

On another occasion, again a few years ago, a friend who runs an NGO from Kolkata that works in North Bengal among the poor tribals had sought my advice for opening a Science Club. His goal was to bring in changes in some of their practices and habits that he thought were steeped in ignorance and superstition that poverty brings



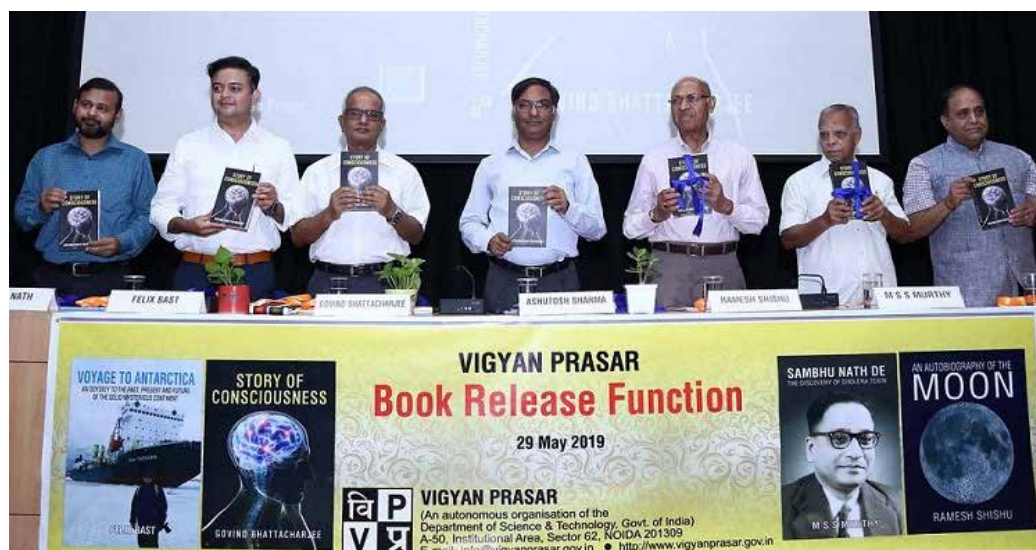
as its appendages and which were causing obstacles in improving their socio-economic status. I directed him to Vigyan Prasar. With Vigyan Prasar's active support, professional advice and material support in the form of books, printed materials and scientific instruments, he could open a science club in an adjacent small town in North Bengal. That single Science Club has now multiplied to 14 vibrant Science Clubs supported by local volunteers trained and supported by Vigyan Prasar – many of them from the tribal communities. Their activities have succeeded in bringing changes which are nothing but extraordinary, given their background and context. One such success story is regarding improving menstrual hygiene for the girls in co-ed schools which lacked a toilet that was hygienically safe for them, forcing them to stay at home for 3-4 days every month. Even the word 'menstruation' was a taboo and girls would apply for leave citing "sickness" as a reason. But cogent and patient explanation by the Science Clubs with the help of audio-visual tools



over a period of time generated awareness and gave the girls the courage to demand safe toilets and availability of sanitary napkins in the school so that they were not forced to stay away from their lessons. The demand and public support eventually forced the schools to change their attitude and provide for all the facilities that they wanted; there is also a “nodal teacher” in the school to supply the pads and monitor the health of the girls during menstruation. This was nothing short of revolution. Then there were unscrupulous vendors who, taking advantage of their poverty, were selling them unhygienic food and drinks at cheap prices that caused many diseases. The Clubs had to teach them all about the effects of adulterated food and drinks and today if any such vendor enters a village, the villagers beat their tribal drums to scare and drive him away. This is what science can achieve, and this is what Vigyan Prasar has been

doing by inspiring and supporting thousands of such activities unknown to and unacknowledged by most, away from the limelight and glare of publicity, away from the dazzling billboards that have become almost synonymous with our times.

In his last interview in 1996, Carl Sagan had lamented, “We live in a society exquisitely dependent on science and technology, in which hardly anyone



knows anything about science and technology.” Things have not changed much even after a quarter century since then. This is because science has by and large remained confined to the scientists who have not taken enough pains to take science to the laymen to spread scientific temper and to nurture a generation that would staunchly believe in and remain committed to the principles of science -in their beliefs and attitudes, in their conduct and deeds. If that was the case, there would not be so many divisions and cleavages in our society today. There is nothing more powerful as a unifying force than science and nothing more disruptive and disparaging as the absence of it. In “Brief Answers to the Big Questions”, Stephen Hawking had said “When we see the Earth

from space, we see ourselves as a whole. We see the unity, and not the divisions. It is such a simple image with a compelling message; one planet, one human race.” Science is a way of thinking, a way of life that empowers people and broadens their mind like nothing else; hence it has to be taken to people by those who practice it and understand it. It is their obligation to society to achieve the goal of “one world, one human race” to lift our civilisation to a higher plane.

The country needs many more Vigyan Prasars, many more Dreams, many more Science Clubs, many more science volunteers. One Vigyan Prasar could only do so much that in some remote outposts of the country, it could help bring in remarkable changes in habits and ignite the flame of knowledge in young minds. That gives me hope. Where there is hope, there is life, and where there is life, there is light. •

**Dr Govind Bhattacharjee** is a retired bureaucrat, an academic and a popular science writer. Vigyan Prasar has published a trilogy on evolution written by him – *Story of Universe*, *Story of Evolution* and *Story of Consciousness*.  
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# My Journey with Vigyan Prasar



## Dr Sukanya Datta

Delhi became my karmabhoomi in 1991; Vigyan Prasar was just two years old at that time having been established in 1989. I had joined the Publication and Information Directorate- a constituent unit of the Council of Scientific and Industrial Research (CSIR). The institute is now known as CSIR-National Institute of Science Communication and Policy Research. A large chunk of its activities was (and remains) dedicated to science communication. This was fortuitous because it was the dovetailing of my duties with Vigyan Prasar's mandate for science communication that led to the crossing of our paths and a forging of an association that has survived, not just the Fin de siècle, but two decades on, the pandemic-induced hiatus too.

The mists of time (or more likely failing memory obscures the first time Vigyan Prasar reached out to me. However, what remains resplendent when I look back is the faith it reposed on me. I was just starting out on my professional journey; a rookie on the job so to say but the leadership at Vigyan Prasar did not hesitate. Vigyan Prasar gave me assignments that not only expanded my horizons but also led me to explore areas into which I had never ventured. If Vigyan Prasar was diversifying; I was branching out too.

The electronic media, for example, was terra-incognita to me when I was asked to write scripts that would be broadcast on Radio. Yet, Vigyan Prasar trusted me with this responsibility. I was also given the opportunity to translate radio-scripts. When doing so, I was able to introduce small gender-sensitive changes that I believed was necessary to spread, subliminally at least, the idea of inclusivity. I am glad to see that over time these changes have been incorporated as a default.

Vigyan Prasar did not just make me learn new skills but also helped to honed these. I learnt how to write radio scripts keeping in mind that the message needed to be broadcast using the minimum number of characters. Every character was a voice; and radio

stations did not always find it easy to source multiple voices. Print medium did not have this constraint though.

I wrote articles frequently for DREAM 2047 and a hardcopy was mailed to me regularly. It was delightful to see the wide-ranging topics that were covered by this publication. Most of the articles were on cutting-edge science with biographies of scientists and snippets too. There was a wide variety of subjects so that the reader was spoilt for choice. DREAM 2047 was bi-lingual; another novelty.

I wrote books on topics suggested by Vigyan Prasar. In time, a compilation of my science fiction stories was also published by Vigyan Prasar. Then one day, there was a request to adapt one of my stories on deep learning into a radio script. It was to be included in the Series on Artificial Intelligence. That was perhaps the culmination of my association with Vigyan Prasar.

From time to time, I edited manuscripts received by Vigyan Prasar -a task I continue to do. This exercise brought me in touch with like-minded people and it was a joy to see many of them become authors for the first time. Some have kept in touch and when we meet at conferences it is with a warm feeling of mutual respect that we greet each other. Vigyan Prasar deserves credit for nurturing this professional pan-India network.

In my decades of association with Vigyan Prasar, I have been privileged to gain some idea about the many facets of Vigyan Prasar and to be able to contribute at different levels. Sometimes, the interaction was not just a learning experience but an eye-opener!

I appreciate that one of Vigyan



**Vigyan Prasar's main activities is Science Popularization. However, what I find truly fascinating is Vigyan Prasar's multi-pronged approach to the task.**

Prasar's main activities is Science Popularization. However, what I find truly fascinating is Vigyan Prasar's multi-pronged approach to the task. Not a single avenue is left unexplored. Print medium, the old warhorse is augmented and ably supported by films, radio, TV, training programmes, clubs, newsletters etc. Vigyan Prasar even has a Gender and Technology Communication Programme.

In my years of communicating science to the public I have come to realize that there is no magic button that can create a rational society overnight. There is no wand that can be waved to transform a country steeped in diverse beliefs

into a society governed strictly by the tenets of science. That is simply not possible.

What is needed is that every citizen be willing to test each and every belief on the touchstone of science and act accordingly. Achieving this is an enormous task. It is my belief that despite all setbacks, the way ahead is by persevering. Just as drops of water eventually wear away rocks, all attempts at communicating science must continue in a low-key yet all-pervading manner. A proactive, firm, non-judgemental, non-confrontational stance that provides rational explanations in the face of superstitious traditions or intentional trickery disguised as miracles or deliberate misguidance to manipulate the uneducated is needed. Vigyan Prasar, by embracing many diverse avenues is doing just that.

Individuals die. Their contributions fade from human memory unless there is someone to carry forward the baton. Institutions on the other hand, have much longer lifespans. Their ability to survive the vicissitudes of time is well known. Their names become entwined with their achievements that are enshrined in people's hearts. I know that Vigyan Prasar is the only organisation in India that is mandated to do science communication and extension to inculcate scientific temper in the country. It has the potential to touch society with the transformative power of science and therefore, it will change the future! •

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**Dr Sukanya Datta** is former Chief Scientist with CSIR and a science fiction writer of repute. She has almost three decades of experience in the field of science communication and has written many popular science books.

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# With Vigyan Prasar, In a Long Relationship



Dr Manas Pratim Das

**M**y relationship with Vigyan Prasar (VP) formally started in May 2003 when Dream 2047, its mouthpiece, carried my article on the Central Glass and Ceramic Research Institute of Kolkata. Prior to that I had been in touch with the editor and was receiving guidance on how to shape a report on an eminent scientific institute of the country. I was advised on the length of the article, the need to interview the director of the institute being reported upon and creating appropriate subsections in the body of the article. The requirement for collecting photographs, labelling those and indicating where to insert the same in the article also figured in my telephonic discussion with the editor. Finally when the article came out in print it gave me enough reasons to be happy. Subsequently I was given assignments on covering the activities of similar institutions along with the liberty of choosing the scientific institutes in Kolkata. I kept hopping from one institute to the other and my coverages included the Bose Institute, the Variable Energy Cyclotron Centre etc. As my articles got published frequently, I gained in confidence. It would not be an overstatement to say that Dream 2047 gave me the kickstart to begin my humble career of a science writer. I was already employed in a media institution and was producing radio



science programmes on a regular basis but I was yearning for some more opportunity to prove my capacity. VP gave me the scope to develop and excel.

The year 2008 is particularly important in this regard. In that year my relationship with VP got an official dimension. As the producer of science programmes of AIR Kolkata I was asked to produce a bouquet of thirteen radio plays based on science fiction. VP was the sponsor and AIR Kolkata was responsible for producing and broadcasting the series. The production process was a great learning exercise for me as it posed some tough challenges. Obtaining permission from the authors or their heirs and finding suitable people for radio

adaptation of the stories were the two most difficult hurdles that had to be overcome. Roping in top grade drama voices was another challenge. A couple of front ranking actors could not understand what a science drama could mean. Again, one actress was cross with me as she thought that the role offered was below her dignity. She recollected on telephone how earlier she was offered the role of heroines only. I had to keep mum and digest her targeted jibes. It was baptism by fire.

When we were preparing for the science drama series in December of 2007, a couple of members from a local NGO visited our Station Director in connection with a science series. They said that they were supposed to have a discussion

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on  
"Popular Science Writing"  
Under DST AWASAR Program



with the science programme producer on a radio series that VP was about to launch. When the Station Director shared this fact with me I thought that there must have been some confusion. We were already producing a series with VP and no NGO was involved in the process. In a few days I realised that the confusion arose due to lack of information and we were indeed required to start working on a series that would run through the whole of the year. So, as it ultimately stood, the Science Cell of AIR Kolkata was producing two separate series in the first quarter of 2008. Both sponsored by VP, one consisted of science drama based on science fiction and the other focussed on Year of the Planet Earth. The NGO, Science Communicators' Forum, was assigned by VP to supply scripts in Bangla for the fifty-two episodes. For those three months I was so hooked to the job that I could not even find time to visit my physician.

Let me chip in here with a very short history of science series on radio in India. The first such series was conceptualised by the National Council of Science and Technology Communication (NCSTC) in 1988 and was titled 'Methods of Science' in English. It was broadcast through All India Radio in several Indian languages. The next big project was also under the tutelage of NCSTC and this time it was on Human Evolution. Broadcast from 1992 to 1994, it was one of the longest running radio science series in the world. Following this there was a long lull in such productions only to be broken by VP in 2008. Since then VP and AIR has collaborated to produce and broadcast more than fifteen science series. Most of these were of fifty-two episodes. The review and planning meeting that followed the completion of each series were immensely effective. Held at different cities of the country every year, the meetings helped producers from

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different parts of the country to know each other and spot the areas for further development. Apart from being the producer of the Bangla version of these series I have been invited to write scripts for the English version. I feel elated even now when I listen to old episodes penned by me on VP website.

The present phase of activities, where VP is focussing on extensive science communication through various regional languages, is also very exciting. Titled 'Science Communication Popularisation and its Extension' or SCoPE in short, this project is slowly spreading across the whole of the country and is including more and more regional languages in its fold. The efficient VP scientists led by an extremely energetic and visionary director is doing wonders. Carefully designed workshops, seminars and field visits are opening up new vistas of science communication. I was pleasantly surprised when I received the invitation for being a member of the core committee of SCoPE Bangla. The journey till now has been very rewarding.

From print to silver screen, VP has explored all avenues of science communication and set exemplary standards in each of those. My evolution as a science communicator is innately connected with many of these activities. I cannot think of my societal role without the involvement of VP. A relationship that started two decades ago is hoping to last for eons. •

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**Dr Manas Pratim Das** has been in the field of science communication for three decades. He is a Programme Executive at AIR Kolkata, and recipient of several awards. He completed his Masters in Physics and PhD (History of Science) from Jadavpur University.  
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# Inculcating Scientific Temper

Dr Amit Krishna De

A country can only survive if it becomes scientifically enriched. There is a need to introduce scientific temper into the mass and create social awareness against superstition and false beliefs. Specially, in any pandemic or disaster like situation, the general public is always at a loss, not understanding what to do and how to proceed. At the same time many scientific research data comes into focus through media. People do not always understand what is right for them, as political interventions and advertisements through different media mislead them. They all start searching for persons/organisations that will guide them through the right path and contradict the fake news. It is only science journalists and science organizations/institutes who can fight this, by means of logic and rational argumentation. They make the mass aware of the truth through interview of well known scientists in different media platform, communicating authentic scientific news/facts through publications of books/newsletters, screening of documentary/films/videos in social media, organising seminars/workshops, etc.

One way of creating scientific temper among the mass is to communicate authentic scientific news/facts through publications of books/newsletters. Many Government organizations/NGOs have been doing the same since decades. National Council for Science and Technology

Communication (NCSTC), DST, Govt of India, has been providing financial assistance to different organizations for holding such activities. CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), an autonomous organisation under the ministry of Science and Technology Government of India has Mandate to disseminate quality science among the researchers and academicians and inculcate scientific temper in common man through publication of journals and Science magazines. NIScPR is publishing magazines in English Hindi and Urdu and using multimedia as a tool for outreach science activities. National Council of Science Museums (NCSM) an autonomous scientific & research organization under the Ministry of Culture, Govt. of India, is also engaged in popularization of Science & Technology among the people at large through science museums.

Besides above, Vigyan Prasar, a professional body under Department of Science & Technology, Government of India, is another such an organisation established in May 1971, that is involved not only in Science population extension activities but also trying to reach the unreached through Science and Technology communication techniques. Vigyan Prasar has been publishing popular science books and newsletters written by renowned scientists and Science communicators from all over the country. A special Endeavour has been taken by Vigyan Prasar keeping



**The need for creating scientific temper to all can only be fulfilled by organising awareness programme in regional languages.**

covid-19 pandemic in view. Since April 2020 Vigyan Prasar has been publishing newsletters on science and technology efforts in India related to covid-19 and corona virus warfare. The objective of this Publication is to make a handy guide to scientists, researches and scholars and those who are interested in knowing various aspects of covid-19 complications.

The need for creating scientific temper among mass can only be fulfilled by organising awareness programme in their regional languages. Vigyan Prasar is undertaking outreach program in regional languages all throughout India. They have recently started publishing magazines not only in English and Hindi but also in different regional languages including Bengali, Tamil, Assamese,



Telugu, Urdu, Oriya, Kashmiri, Marathi, etc. They have already started making program in science communication, popularization and extension in Bengali, Tamil and Marathi languages. A number of district-level and school-level workshops in West Bengal have been organized in Bengali. Science communication, popularization and extension programme in Tamil is being organized with the help of a number of local Science & Technology organizations in Tamil Nadu. Besides these, efforts are being initiated to popularize Science & Technology through newsletters, books, seminars, district level school-level workshops, webinars etc. in Kannada, Gujarati, and Marathi languages.

A single organization alone

cannot fulfill the scientific demands throughout the country. It has to co-ordinate and function jointly with many such organizations/NGOs that are concerned with popularization of science. Vigyan Prasar since last few decades has been conducting science communication activities with different organisations. Since last six years Vigyan Prasar has been organizing a twenty week "Training Program on Science Communication and Media Practice" jointly with Indian science news Association (ISNA), Kolkata. The candidates are trained through different workshops on traditional and electronic media to create scientific temper among the people. Besides, two different e - papers "scientific communication" and "Bigyan kahan" are published

in English and Bengali respectively by Vigyan Prasar and ISNA. Vigyan Prasar is also collaborating with Indian Science Congress Association (a professional Body under Department of Science & Technology, Govt. of India) since last few years to organise "Science Communicators Meet" during the Indian Science Congress annual session. Vigyan Prasar has taken up nation wise scientific awareness activities. VIPNET, an acronym for Vigyan Prasar NETwork, was added as a new project to Vigyan Prasar in 1998 with the objective of providing a fillip to the science clubs movement in India. This is a network to weave all science clubs, societies, organisations which are already established, or are going to be established, and are willing to work with Vigyan Prasar to strengthen the popular science movement in the country with far-reaching implications for the development of society.

It is obvious, that even though Government and Non Government Organisations may try their best to uplift the scientific temperament of the society, the role of individuals in this endeavor cannot be ignored. Some scientific minded persons and also few science communicators are individually persuading day and night to make people free from superstition and false beliefs. If these persons join together and take up assistance of other organisations like Vigyan Prasar, then it is hoped that the society will slowly and slowly improve its scientific temper in near future and become a scientifically enriched community. •

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# Metamorphosis of SCoPE, the Vigyan Prasar Way

Prabhakar Ingle

Since its inception in 1989, Vigyan Prasar (VP), an autonomous organisation under the aegis of the Department of Science and Technology (DST), Ministry of Science and Technology has been engaged in various activities related to science dissemination, including books of science popularisation, activity kits, science posters, science films, radio programmes etc.

I got an opportunity to know this organisation since its early days as I started my career in science communication in early-1991 with the Publication and Information Directorate (PID). Though PID under the Council of Scientific and Industrial Research (CSIR) and VP under DST are engaged in Science communication & dissemination, both organizations have their own distinct identity.

PID was later renamed as NISCOM (National Institute of Science Communication) in 1996 and as NISCAIR in 2002 after merging with INSDOC (Indian National Scientific Documentation Centre). It was further merged with NISTADS last year and got its present name as National Institute of Science Communication and Policy Research (NIScPR).

Though almost all apex scientific bodies in the country, including CSIR, DAE, DBT, DOS, DRDO, DST, ICAR, ICMR, MoES etc., have units, offices and departments dedicated for activities related to



outreach, publication and science dissemination VP and NIScPR stand apart from others in these activities over the years. Vigyan Prasar, under new leadership, has added many new activities during the last few years, including Science Communication Popularization and its Extension (SCoPE).

SCoPE is using all available platforms for communication, from print to electronic to digital to social media, for nurturing and inculcating a scientific temperament. This creative, cross-disciplinary and effective platform enables dialogues and knowledge transfer.

Vigyan Prasar, in the last few

years, has been disseminating scientific developments in the national laboratories all over the nation and is certainly helping to develop scientific temper among the citizens. Though I am associated with most activities of Vigyan Prasar directly and indirectly, I would like to mention a few of them here. Vigyan Bhasha, Azadi ka Amrit Mahotsav, SCoPE in Research (AWSAR), and SCoPE through Indian Science News etc. are some prominent ones.

**Vigyan Bhasha:** Science, Technology and Innovation Policy (STIP), 2020 has emphasized on promoting and facilitating science, technology and innovation accessible to all citizens. Vigyan Prasar over three decades was primarily engaged in disseminating the development in science and technology through English and Hindi languages. Vigyan Prasar has consolidated and reoriented its existing programs and projects and added many new ones. Taking leaf out of STIP 2020, SCoPE program takes science communication in Indian languages with local and hyper-local contexts for last mile connectivity. Vigyan Prasar for the last three years has been popularizing science in various Indian languages. I got an opportunity, since its beginning, to associate myself with this project that takes development in science and spreading it to last person in the society through various Indian languages. As of now Vigyan Prasar is publishing the popular science monthly magazines in Assamese, Bengali, Gujarati, Kannada, Kashmiri, Marathi, Odia, Punjabi, Tamil, Telugu, Dogri, Maithili and Urdu languages.

**Azadi ka Amrit Mahotsav:** On the occasion of the National Science Day 2022, Vigyan Prasar



coordinated a week-long mega event Vigyan Sarvatra Pujyate simultaneously at 75 locations all over the country consisting of 75 Programmes, 75 Expositions, 75 Lectures, 75 Book releases, 75 Posters of Scientists, 75 Posters of Milestones, 75 Science Films and 75 Awards. In this effort Vigyan Prasar joined hands with DST, DBT, CSIR, MoES, DAE, DOS, ICMR, AICTE, and DRDO. I attended this mega event at VNIT Nagpur.

**SCoPE in Research:** Through programmes like AWSAR (Augmenting Writing Skills for Articulating Research) being coordinated by Vigyan Prasar and that aim to disseminate Indian research among the masses in an easy-to-understand and interesting format to a common man, the organisation is not only spreading science but also encouraging PhD scholars and Post-PhD fellows in S&T streams to develop a habit of writing popular science stories, thereby creating a pool of science communicators for future need of the country.

With my association with this programme, I have noticed much improvement in the content and

quality of the presentation. Vigyan Prasar has conducted many workshops in the last few years at various locations in the country to guide the contestants in writing popular science articles.

#### **SCoPE of Indian Science News:**

Through the India Science Wire programme Vigyan Prasar facilitated wide publicity about the science happenings in the national laboratories. A dedicated and expert team of science communicators in Vigyan Prasar keeps track of the development in science and writes popular stories, and distributes it to the media at the national level. Vigyan Prasar works with almost all laboratories of apex scientific bodies in the country. With my NISCAIR background and personal contacts with science journalists at national level it was easier for me to get national attention for the high impact work done in my institute but was not same for other labs. •

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# An Umbrella Over 'Popular Science'

Siddhartha N. Joardar

Science popularization initiatives got momentum fifty years back, in late 60's and early 70's, when several small scientific organizations started their activities aiming science popularization at the community level. Several small science clubs came into existence that time in Kerala, Maharashtra, Pondichery, Assam, West Bengal, Orissa and several other states. In early 80's Government initiatives to form National Council for Science and Technology Communication (NCSTC) for popularisation of science and development of scientific temper among the people had been considered as a milestone to the journey. Among several activities, four were major, viz. (1) Bharat Jan Vigyan Jatha, held in 1987 and 1992 in which science educators visit in villages to spread scientific awareness. It is considered as "the biggest science communication experiment anywhere in the world; (2) National Children's Science Congress, an annual conference started in 1993 to develop and promote scientific knowledge among children of 10-17 years of age; (3) National Science Day, held every year on 28 February, a nation-wide observation of the day of discovery of the Raman effect in 1928 and (4) National Teachers' Science Congress (NTSC), a biennial conference for science teachers and scientists, started in 2003.

For taking up large scale science popularisation tasks, an autonomous



organisation called Vigyan Prasar (VP) was set up by the Department of Science and Technology (DST), Government of India in the month of October, 1989. The primary objectives set were (i) to undertake, aid, promote, guide, and coordinate efforts in popularisation of science and inculcation of scientific temper among the people and to increase the knowledge, awareness, and interest about science and technology among all segments of the society; (ii) to provide and promote effective linkages on a continuing basis among various scientific institutions, agencies, educational and academic bodies, laboratories, museums, industry, trade, and other organisations for effective exchange and dissemination of Science & Technology information; (iii) to undertake development of materials – audio, visual, audio-visual and printed methods and modes of communication, so as to enable the masses to better understand, appreciate, and comprehend abstract scientific principles and practices and (iv) to organise research work, courses, workshops, seminars, symposia,

training programs, fairs, exhibitions, film shows, popular discussions, street plays, quizzes, song/dance-dramas etc., in furtherance of the objectives of the society

VP executes its activities through various print (journals, newsletters and books), electronic (e.g. Science on television, DD science etc.), radio (e.g. Ham radio), digital media platforms (e.g. India science OTT channel), films (e.g. National Science Film Festival of India) and various science outreach programmes (e.g. Vigyan Prasar network of science clubs). However, as per my understanding, at the present time, the most popular and effective project of VP is SCoPE (Science communication, Popularization and Extension) in Indian languages. This includes Marathi, Tamil, Bangla, Urdu, Kashmiri, Punjabi, Gujarati, Kannada, Telegu, Assamese and many more. To spread scientific temper and to build up scientific outlook among the general mass to make their lives and society around them are better place to live, use of local language is the best option. The prime objective of SCoPE is to develop and nurture science communicators in various



Indian languages with potential stakeholders such as students from Institutions of Higher Learning, Journalists, S&T-based voluntary organisations and women groups, etc.

The journey of SCoPE in Indian languages (Vigyan Bhasha) in the country started with organizing a two-day conference on 26-27 April, 2019 at CGCRI, Kolkata in association with Central Glass and Ceramic Research Institute (CSIR-CGCRI) and Indian Science News Association (ISNA). During the conference, representatives of various organisations involved in science communication, popularisation and extension in Bangla came together to explore areas/ projects to work together in different brain storming sessions. A 'call for paper' was circulated and experts were invited to write concept paper/article in Bangla on the theme 'Science communication, popularisation, and outreach in Bengali – The road ahead'. Vigyan Prasar has published a book based on thirty selected articles. One hundred sixty experts from different institutions participated to make the conference a grand success. Like the project Bangla, project Urdu and project Tamil initiatives were equally successful. These were followed by project Kannada, project Malayalam, and project Gujarati etc.

VP successfully organised a colourful event on the 5th India

International Science Festival (IISF) in Kolkata from 5-8 November where science communications through science films and media practices were nurtured and highlighted. Various stakeholders like students, farmers and media personnel were tremendously benefited.

The COVID-19 Pandemic although disrupted the physical activities, could not stop VP's innovative and various timely initiatives via on-line platforms. VP's one such remarkable initiative during pandemic situation was publication of Newsletters in various local languages (e.g. Vigyan Katha in Bengali). Vigyan Katha first published in May, 2022 with much hope and enthusiasm. Presently, it has successfully published vol 3, issue 9 maintaining its high content standard and quality presentation and hence got wide appreciation from the readers.

VP successfully organised the second edition of National Bangla Science Communicators' Conference 2022 at CSIR-IICB-Jadavpur, Kolkata during 29-30 April 2022. Not only the reputed scientists and head of scientific organizations in and around Kolkata, a large number of science communicators and writers from different districts of West Bengal participated and shared their views in the conference. A preliminary network of science workers, communicators and popular science writers of West

Bengal could be developed that laid the foundation of collaboration and joint ventures of various science communication activities in the state through Vigyan Prasar.

During recent past VP supported various scientific organizations of the state like us (People's Association for Science and Environment, PASE) in organizing various seminars, workshops and training programmes meant for science awareness among school and college students. One such event (Observance of World Environment Day, 2022) was organised by PASE with active support from VP and JBNSTS (Jagadis Bose National Science Talent Search). As one of the mandates of PASE, various Students' Activity Programme (SAP), viz. Debate, Extempore talk, Poster presentation competition could be arranged.

I personally feel that VP may take a lead role to coordinate the already existing scientific institutes and organizations in West Bengal with the aim of developing a network of science communicators in the state to support and patronage. Besides this, VP may act as linking force between the Research Institute(s)/ Universities and local science clubs (organizations) while executing Institutional outreach programme (science popularization) in certain villages. Further, VP should take initiatives for organizing workshops for students to develop and nurture scientific temper, humanism, the spirit of inquiry & reform as a part of their constitutional fundamental duty.

Let us raise the slogan of VP - 'Think scientifically, Act scientifically'. •

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# The Force Behind A Silent Revolution

Chandra Mohan Nautiyal

Very recently, I was pleasantly surprised to hear the director of a national institution tell me how now several scientists in various laboratories in his Institute had made short films using mobile platform, which they now regularly show to those visiting their laboratories. This, he added, made it so easy to explain the complex concepts to visitors. This new trend was following a workshop by Vigyan Prasar on film-making organized in the previous year. This is just one example of impact of just one activity.

Vigyan Prasar (VP) that took roots in 1989, has blossomed into an organization which, even as maintaining a small size, is blooming all over with a variety of flowers, fruits and leaves.

The all-round growth may not have been envisaged three decades ago but it has happened to everyone's pleasant surprise. We have a young generation that feeds almost only on digital content while there are others who still look for the traditional menu. VP has adroitly attuned to the changing media scenario, where digital media is quietly edging out the conventional one.

Books and magazines in many languages, audio-video documentaries, TV shows, radio and TV programmes, thousands of programmes on OTT platform, the range of activities of VP is wide.



It has a heritage of unforgettable programmes like Vigyan Rail that has had several successful runs since 2004 in various formats. The now annual feature of Science Film Festival (IISFF) which attracts films from many countries; a tradition in publishing low-priced books with authentic content such as on the iron pillar of Mehraul or on lives of scientists like Acharya JC Bose who fought the foreign rule with their own variant of Satyagrah, and on Indian woman-achievers in science, are some examples. VP has trained tens of thousands of science communicators and science film-makers through hundreds of workshops pan India in various genres of science communication.

Now and then, I get pleasantly surprised to run into science writers trained in such workshops, who are now spread all over and now enriching media in various capacities.

Thirty-three years is a short span for an organization but Vigyan Prasar has grown into a formidable movement in this short period and carved a niche for itself. It is astonishing to see the reach VP now commands and foot-hold it has made. Thousands of VIPNET clubs spread across the length and breadth of India continue to engage children in creative science activities, in line with the old adage of 'I do I understand'. These clubs are complementing the science education in India and that too with



meagre investment. The science news services like ScienceWire have kept the hope alive that the mainstream media never complains about not knowing what to print on science. Programmes like Ham Radio, Year of Physics, radio serials like Dhartee Mere Dhartee have kept the flame aglow at different stages. Relating to the tribal people is another activity worth mention. The bi-lingual Dream2047 has established its brand and compares to the best. VP has joined hands with S&T organisations and many research institutions in holding science festivals and other activities.

Having known Vigyan Prasar since its infancy and having had a very close view of its many activities (and sometimes being a part of them), I have overlooked certain achievements which might otherwise be noticeable. People who successively shouldered directorial responsibility, Dr. NK Sehgal, Dr. VB Kamble, Dr. Subodh Mahanty, Er. Anuj Sinha, Dr. Gopi Chandran and now Dr. Nakul Parashar, all of them polished one or more aspects of the organization during their tenures. The proliferation of publications in various regional languages is indeed significant

### **Thirty-three years is a short span for an organization but Vigyan Prasar has grown into a formidable movement in this short period and carved a niche for itself.**

to make various language-areas connected to science communication. They all deserve kudos on having shaped Vigyan Prasar into an organization that it is now.

Vigyan Prasar has been an active major agency in shaping the science communication scenario in India. On the completion of 33 years of meaningful leadership in the field, Vigyan Prasar deserves congratulations. One can only wish that more and more support come to it in all forms and it continues to glow and grow and also, in the process, continue to contribute to nation's growth.

Vigyan Prasar is not a PR institution. It is a vibrant organization that finds new creative paths in science communication. Keeping a group of creative people constantly

motivated is not easy. 'Managing' is not the right word while dealing with creative people. These are people who, as my friend Sh. RK Anthwal puts it, have to take care of tent (organizing) and content (creative side) both, not a very common quality. The VP programmes address the basic curiosity in human beings, particularly in the young minds, and in the process making them creative, innovative and rational. One may easily see that communication of science is desired for the mental health of the society and just like public health it should be supported. Apart from its being in tune with Article 51 A(h), it promotes a temper which any country needs.

But even the faster runner, best thrower, or one who jumps the highest has to constantly ask, 'what next?' The challenges are many in quality and quantity both. Perhaps Vigyan Prasar has to spread its net and involve a much wider circle. It has done a great job of engaging a huge young population but there is a big segment of the remaining population that hankers for scientific information. These are people who are educated even if not in science. Books, magazines and AV stuff for them should be created. Of course, this would mean expansion of Vigyan Prasar.

Even with many mile stones touched and many a new path treaded; one clearly sees a much greater role for Vigyan Prasar in coming years. All the best. •

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# Connecting Science with the Common Man

Sunderarajan Padmanabhan

There are a large number of research institutions in the country that cover a wide spectrum of science and technology – from oceanography, geophysics, chemicals, drugs, genomics, biotechnology, and nanotechnology to mining, aeronautics, instrumentation, environmental engineering, and information technology. They provide significant technological intervention in many areas concerning societal efforts, which include environment, health, drinking water, food, housing, energy, and farm and non-farm sectors.

The current decade 2021-30 is expected to bring about transformational changes to Indian science, technology, and innovation (STI). Under Prime Minister Narendra Modi, India has increased the gross expenditure on R&D (GERD) more than three times in the last few years and as per the latest data, India has over 5 lakh R&D personnel, a number that has shown a 40-50% increase in the last eight years.

The last eight years have also witnessed a doubling of women's participation in extramural research and development. Besides, India now occupies 3rd rank in terms of the number of PhDs awarded in science and engineering (S&E) after the USA and China. With the shifting global powers and technology becoming



the epicentre of international engagements and rule making, India is living up to global benchmarks.

However, Indian science suffers from a major lacuna as the coverage of science and technology-related developments, particularly those relating to research done in the institutions, has generally been very poor in Indian media till recently. Even significant research and development efforts, barring very few events such as the launch of rockets or satellites and the commissioning of nuclear reactors, were not being sufficiently reported and reflected upon in the Indian media.

As a result, science reporting in the country was largely based on research achievements and major scientific events overseas due to the media outreach efforts of individual institutions abroad. Many times significant works by Indians in India even got reported in the Indian media only after they have been covered by foreign publications.

There are several reasons for this situation. One of them was a lack of access to good local content for the media. The problem is now increasingly becoming a thing of the past. A project of Vigyan Prasar, which has been engaged in science communication and dissemination of S&T information for a number

of years, is gradually succeeding in turning the tide. The core of the project named Indian Science News and Feature Service (ISNFS) is a news agency.

The news agency named India Science Wire (ISW) is totally dedicated to disseminating information related to developments in Indian research institutions, universities, and academic institutions only. The information is published in the form of crisp news stories and features, which are written and edited by a team of professional science journalists with decades of experience in science journalism.

They are released to media houses on a daily basis. They are also uploaded on a specially designed website and simultaneously promoted through social media – Twitter and Facebook. At present, the service is available in English and Hindi. It is proposed to add more languages in coming times.

A total of 625 stories were produced and released during the recently concluded financial year, April 1, 2021, to 31st March 31, 2022. Surely, dissemination of these stories and their outreach assume as much importance as their generation. Here atoo, the service had been fairly successful. The stories had a total of 5,699 print, digital, electronic, and social media imprints during the period.

The social media outreach of ISW through Twitter and Facebook is also gaining momentum with new users getting added on a daily basis. The Facebook page of ISW has reached a landmark figure of about 13,000 followers. With respect to Twitter, ISW enjoys the patronage of over 20,000 followers with over 7 lakh of tweet

impressions during 2021-22.

At present, the news service is being distributed to about 200 media outlets on a daily basis. The combined reach of these media houses is estimated to be more than 7 million. The list of media outlets using ISW stories includes The Hindu, Hindu Business-line, Amar Ujala, Dainik Jagran, First Post, Outlook, Catch News, Yahoo.com, Down To Earth, etc. A weekly digest of ISW stories is also sent out to about 1,600 email subscribers.

## **India Science Wire (ISW) is totally dedicated to disseminating information related to developments in Indian research institutions, universities, and academic institutions**

The in-house team of ISW comprises minimal editorial, technical and social media staff. Efforts have been made to build a team of high-quality science writers to work on a freelance basis. Major scientific conferences such as the Indian Science Congress and the India International Science Festival (IISF) were covered by the reporters and editors of ISW.

The institutions covered by ISW include Indian Institute of Science, Tata Institute of Fundamental Research, Indian Institutes of Technology (IITs), Indian Institutes of Science Education and Research (IISERs), laboratories of the Council of Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR), Indian Council of Agricultural

Research (ICAR), autonomous institutions under the Department of Science and Technology (DST), the Department of Biotechnology (DBT), Ministry of Earth Sciences, Department of Space and Department of Atomic Energy, as well as leading universities such as Jawaharlal Nehru University (JNU), Delhi University (DU), University of Hyderabad, Banaras Hindu University (BHU), and the University of Madras.

It is, however, still early days for ISW, which was launched just five years ago. There is a huge scope for expanding and deepening its coverage and reach. For instance, presently news and other reports are disseminated in English and Hindi only. There are plans to bring them out in other Indian languages to ensure that information about research and development taking place in Indian institutions reaches every nook and corner of the country. A small beginning has already been made: seven regional newspapers and online sites pick up stories from ISW. The numbers have to increase and efforts are on.

ISW is expected to play a major role particularly in the context of the various targets set by the Government of India for the science and technology sector for 2030. The targets include making India to be among the top 5 in terms of quality of research outcome; enabling women to reach a level of at least 30% participation in science; making India to be among the top 3 global leaders in STI; and helping India achieve Atma Nirbharta in technology. •

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# The Synonym of Science Popularization

Shakunt Pandey

When one thinks about the institutions that are actively involved in promoting scientific thinking and applications, primarily among the school and college students, as well as other stakeholders or simply put for anyone and everyone interested in science, the name Vigyan Prasar instantly comes to our mind. This important institution was established in the year 1989 to promote and achieve the objectives of the Government of India to foster an interest in science. It is an autonomous institution of the Department of Science and Technology, Government of India.

The reach of Vigyan Prasar can be felt and seen everywhere. First and foremost, its website is a treasure trove of scientific knowledge and information. Anyone who accesses the website is left with scientific wisdom and with a quest to know more. Vigyan Prasar is right there on any viable or conceivable media of communication viz, TV, Radio, OTT, etc. All India Radio, Doordarshan and the Sansad TV are well known for broadcasting and telecasting science-based serials and programmes of Vigyan Prasar. Vigyan Prasar Network of Science Club popularly known as VIPNET takes an active role in being partners of science clubs in schools in promoting science learning across the length and breadth of the country. The science film festival is unique and enriching



at the same time for being pioneer in showcasing exclusive science themed movies, thereby instilling an interest in science.

We know that books and journals are one of the most important media of science communication, obviously, there is no dearth in its production and distribution by the institution. Vigyan Prasar's popular bilingual newsletter in English and Hindi is Dream 2047. As its title states, that too emphatically, the collective dreams of the nation to progress and

achieve in all spheres with the motto "think scientifically, act scientifically". In 1947, the nation began its journey towards scientific growth and development, is now inching towards attaining the impossible, overcoming earlier thought unsurmountable barriers. The nation which was ridiculed for not even making a needle is now a powerhouse in all spheres of science. When the world was engulfed in dark and gloomy clouds of the pandemic, when one was not sure of seeing another day, the quest

to find an answer to the miseries and sufferings of the human race was not confined to the laboratories of the first world countries. Our scientists too came out with world class vaccines to tame the disease.

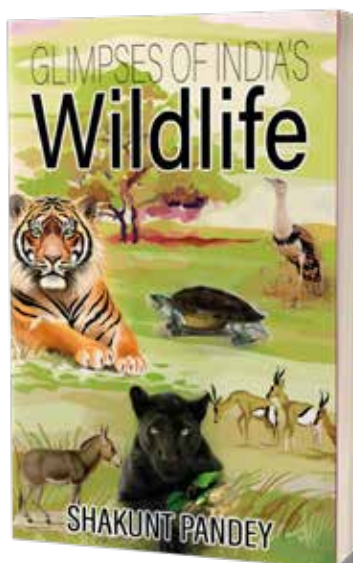
The journey of Dream 2047 began in 1998, with issue dated 15th October 1998 being its first comprising of mere six pages! The popularity and reach of Dream 2047 can be gauged from the fact that it reaches almost sixty thousand schools, colleges and anyone having an interest in the subject including academics and scholars. The icing on the cake is that all the issues of the wonderful newsletter is available for free download, thereby broadening its reach. It is believed that science is best learnt in one's mother tongue, so Vigyan Prasar is now bringing out its newsletters in other languages. May 2020 which is remembered for the gloomy Covid pandemic was also the time when newsletter in Bangla titled Bigyan Kotha was started with an appropriate issue on the Coronavirus.

Another important goal of Vigyan Prasar is to bring out popular science books in different languages and on a variety of subjects thereby making science interesting and easily understandable. The books are reasonably priced and within the reach of all. Further, all the printed and reprinted books are digitised and available free for reading or downloading at a click of a button. Let's take a look at some of these fascinating books to have an idea of the quality of books on science. The 'father of evolutionary biology' Charles Darwin's autobiography, Michael Faraday's *The Chemical History of a Candle* also having a Hindi, Marathi and Tamil version. J.B.S. Haldane's works, *My Friend Mr. Leakey*, *Everything Has a*

*History, Science & Everyday Life*. *The Insect World* of J. Henry Fabre, *Soap bubble and the forces which mould them* by C.V. Boys, etc.

Who doesn't know our Nobel laureate scientist Sir C.V. Raman? His famous lecture on the colour of the sky with emphasis on scientific methods titled *Why the sky is blue?* is also available.

Former editor of *Science Reporter* and prolific author Biman Basu's myriad work on science is a must read for budding scientists



and students. The titles, *Tools of Astronomy*, *Earth's changing climate*, *Planet Earth in a nutshell*, *The Weather Riddle*, *The DNA Saga*, *Chemistry in life*, *Yash Pal: A life in Science* is enriching and a work of scientific wisdom.

The editor of *Science Reporter*, Hasan Jawaid Khan's *Mountains Under Siege* is an important and timely work familiarizing readers with various types of mountains and their formation, umpteen benefits that we get from them and warning humans about adverse impact we are having on their ecology and steps being taken to bring them back in the pink of health.

Dr. Rintu Nath's *Moments in Mathematics* is a must read for anyone aiming to be confident in number crunching. He describes fundamental mathematical principles in a lucid and easy to grasp style.

On a personal note, being a regular contributor of Dream 2047 for a long time and author of *Glimpses of India's Wildlife* soon to be published by Vigyan Prasar, I would like to state that my experiences with it have been both pleasant and worth cherishing. The associate editor of Dream 2047 Dr. Rintu Nath is a down to earth person and an editor who encourages. He encouraged me to contribute articles to Dream 2047. In 2017 he suggested that I write a popular science book on my domain of expertise and I came up with my book on wildlife. It could not have been possible without his encouragement and his pushing me to complete the manuscript within the deadline.

We have witnessed 75 glorious years of freedom and have only 25 years to reach our independence centenary. The growth and development of science has undergone many trials and tribulations and now we are at the stage, where our scientists are not only noticed but acknowledged globally. The role of institutions like Vigyan Prasar will be as important as ever as it strives to take science to the remotest and unreached places. Vigyan Prasar is a jewel in the crown of science popularization programme among the masses. The dream to make India scientifically developed is what Dream 2047 is all about! •

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**Shakunt Pandey** is an author, journalist and a popular science writer. His book *Glimpses of India's Wildlife* is being published by Vigyan Prasar.

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# Yes Sir! We Have It!

**Vigyan Prasar in its basket has anything and everything on Science Popularization.**

Dr. Manoj Kumar Patairiya

**H**undred years before creation of Vigyan Prasar, Charles H. Duell was the Commissioner of the US Patent Office in 1889, who was widely quoted as having said "everything that can be invented has been invented...and the patent office would eventually close." However, we may agree that there is still much to be invented and discovered and will continue so. Similarly, the founding Director of Vigyan Prasar Dr. Narender K. Sehgal used to say "I want to see the science communication entities such as NCSTC and Vigyan Prasar to close down." He intended that if the purpose of science literacy and scientific temper is achieved and science communication activities become part of daily life like many festivals and rituals such as Ram Leela, etc., to continue by the society on its own, there is no need of these organizations! Surprisingly, looking at the Bollywood movies and songs, which are now flowing like anything especially after the advent of new OTT platforms, at one point of time were thought to have dried-up and there was no newness. Life goes on and world moves on so as Vigyan Prasar - continuously and untiringly bubbling and flowing with new ideas, inventions, activities, plans and projects covering wide spectrum of science communication in India.

I may recall when I was in CSIR-

NIScPR (then PID) I used to visit Dr. Sehgal in DST in late 1980s in connection with a variety of science communication activities and was very much impressed and inspired by his vision, mission and straightforwardness, we discussed for hours a range of activities, ongoing and upcoming, on science communication in the country. Eventually, I was appointed in DST as Senior Scientific Officer Grade-I for NCSTC when Dr. Sehgal was heading both NCSTC and Vigyan Prasar. To begin with I was given the responsibility of publications in NCSTC that included Vigyan Prasar publications as well. A number of publications came out in a very short span of time, i.e. Jano Aur Boojho, Kahani Maap Tol Ki, Gayen Gana Khelen Khel, Let's Sing and Play, Let's Put Things Together, and Hornbill Series with BNHS, etc., including reprints and revisions of some earlier publications.

Vigyan Prasar once started its journey in inventing newer avenues and implementing new programmes in science communication has never looked behind. Be it "Newspaper Clip Service", "Ready-to-Print Science Page" "Vigyan" in Hindi, English and some other Indian languages started publishing in 21 newspapers across the country, or Tele Text Service on Doordarshan, to mention a few, all of them have done well to propagate science in society. I am happy and fortunate that I have been closely



associated with all the activities since very beginning to be able to serve the nation especially in conceptualizing and developing the building blocks of science communication.

A sense of togetherness prevailed over the period while NCSTC and Vigyan Prasar were working hand in hand with a few hiccups to promote mega programmes and activities, such as a countrywide awareness programme built around "Total Solar Eclipse" in 1995 that was a remarkable landmark in the history of science communication. While NCSTC contributed in conceptual and organizational aspects, Vigyan Prasar took care of mass scale development and production aspect of software materials and kits in different Indian languages. Almost at the same time, NCSTC started a mega series of training and orientation programme in science writing and journalism for different mass media in regional languages where Vigyan Prasar scientists actively took part; some 600 workshops were organized across the country.

A number of universities and institutions have started masters',



degree, diploma, and certificate courses in science communication with an initiative of NCSTC/ DST. Incidentally, a number of Vigyan Prasar scientists are the products of these courses and have taken up a variety of science communication programmes and activities over the period to enrich Vigyan Prasar. A number of popular science magazines in Indian languages were also catalyzed and supported over the period, such as *Thulir* (Tamil), *Chekmuki* (Malyalam), *Chakmak* (Hindi), *Paras Mani* (Hindi), *Prayukti* (Bengali), *Vigyan Parichay* (Kannada), *Arivial Punga* (Tamil), *Nirantar Soch* (Punjabi), *Vigyan Aap Ke Liye* (Hindi), *Swadeshi Science* (Malyalam), *Vigyan Diganta* (Oriya, also in Braille), *Vigyan Dhara* (Braille), *Marathi Vigyan Parishad Patrika* (Marathi), *Vigyan Darshan* (Gujarati), and *Vigyan Jyoti* (Assamese), etc. Publication of Dream 2047 added value to science communication efforts as it also envisaged a target of enhanced scientific awareness and scientific attitude among masses to be achieved by 2047 – the Centenary Year of India's Independence. The

country is largely benefited towards that by these efforts by NCSTC and Vigyan Prasar.

Subsequently, after infusing new blood into Vigyan Prasar and new leaderships in NCSTC and Vigyan Prasar, the legacy of these activities continued in association and the country has witnessed a plethora of new generation science communication programmes and activities. Vigyan Mail and Science Express are the unparallel examples of science communication elsewhere in the world that have aroused a wave of excitement among people in general and students in particular. OTT India Science Channel, One Hour Science Show on Doordarshan, Science News Service, Bhasha Project SCOPE to reach out to the nooks and corners of the country through popular science publications in regional languages and more prominently in some of the tribal languages are the significant milestones in the annals of science and society programmes. The reach and diversity of programmes are so rich and wide to cover almost the entire canvas that needs encouragement and support. Vigyan Prasar and NCSTC partnership has reached to a point where many major programmes and activities were undistinguishable. A range of programmes and activities that have roots in NCSTC were of late undertaken by Vigyan Prasar, such as publications, audio-visual, and training, etc. Even the government's official National Science Day function is now organized by the Vigyan Prasar on behalf of NCSTC, DST.

Although, on the other hand we tend to think these new initiatives will be more extraordinary, advanced and innovative than those which preceded them. Many prior advances were revolutionary and

extraordinary too. An invention need not be revolutionary, or even unique, to be significant. Many humble and simple beginnings sometime become so exciting and relevant that nobody had even thought of as many new inventions are sometimes better derivatives or offshoots of their rudimentary ideas and works.

I think, almost all the science communication activities need to be undertaken in all regional languages to have the last mile connectivity with the people and therefore the Bhasha programme SCOPE has the potential and scope to cover the entire range of science popularization activities under its ambit. In order to reap better results of various pursuits of science communication, there is a need of an approach of integration with plurality as generally it is said that NIScPR is the nursery of science communication, Vigyan Prasar being a playground, and NCSTC is more towards in a role of policymaker and savior to shape and advice science communication. Once the roles are defined and understood clearly and distinctly with a space of some overlaps there may be no point of raising eyebrows and science communication may grow in leaps and bounds in the desired manner to meet the expectations of the society at large with a dose of science awareness and scientific temper.

I am delighted to convey my heartfelt best wishes and congratulations to the entire Vigyan Prasar family, NCSTC, DST and all stakeholders on the occasion of the 33rd Foundation Day of Vigyan Prasar. •

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**Dr. Manoj Kumar Patairiya:** Pursuing transdisciplinary communications between sciences, media, publics and governance. His leadership role in national and international organizations in information science and communication is well recognised globally.

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# Taking Science to Grassroots

Prof Shahid Rasool

**M**y active association with Vigyan Prasar, began in September 2021, with organisation of 'National Urdu Science Congress' in Kashmir. Prior to this I had a limited interaction with VP during National Science Film festivals organised by it in various parts of the country. Somewhere in last week of August 2021, I got a call from Dr Nakul Parashar, the dynamic and visionary leader of the organisation, suggesting to organise National Urdu Science Congress in Kashmir in September. He sought our collaboration. Initially, I was a bit skeptical, as the time was too short to make arrangements for a National level conference, expecting participation of over 40 high profile

dignitaries, but the confidence and encouragement that I received from him, the Vigyan Prasar team, backed up by support from the authorities at Central University of Kashmir and the University of Kashmir, resulted in successful conduct of a mega National Urdu Science Congress in Kashmir, the first of its kind, on 22 and 23 September, 2021. Despite Covid pandemic and apprehensions, over 400 delegates, including 130 mobile school science teachers, from across the country physically participated in the congress. On the side lines of the Science Congress, we discussed the possibility of Memorandum of Understanding (MoU), for SCoPE in Urdu and Kashmiri. Only a week after, on 30th September, 2021 we signed two tripartite MoU, between Vigyan Prasar, Central University

of Kashmir and the University of Kashmir. Soon after the SCoPE secretariate was established at CUK. Since then 10 issues each of science magazines; "Tajassus" in Urdu and "Ghaash" in Kashmiri have been published. 10 science popularisation workshops/webinars/ events for writers/young filmmakers and students were also organised, creating a vibrant movement for packaging and sharing of scientific knowledge. We also became part of a week-long National Science Festival in February 2022, that attracted over 1000 people from different parts of Kashmir. The swiftness with which the MoU, were signed and implemented, testifies the seriousness and dynamism of Vigyan Prasar in taking science to the grassroots in their own language.



On the face of it the activities that we conduct are baby steps but they hold promise of a big leap for creating scientific temper in the society, that is still caught in superstitions. Our country has made significant advances in science and technology and has earned the global respect for its contribution. We have a system and infrastructure in place that fosters the research and development in all the spheres of science and technology. From high end research labs to grassroot innovators we have an army of scientists, working with seriousness and zeal, generating scientific knowledge and techniques. But it is observed that most of the scientific knowledge generated remains confined to the research labs in the form of reports, research papers in journals or chapters in books. A small portion of this highly useful scientific knowledge reaches common people. The scientific advances made are not significantly translating or transforming the communities at grassroot into a scientific society. There is a total disconnect between the scientific community and the people in general. To bridge this gap, Vigyan Prasar, the only organisation of its kind in India "that is mandated to do science communication and extension", is silently but significantly contributing to inculcate a scientific temper in the country. The idea of Vigyan Prasar is to take science from labs to all the people across the country irrespective of their geographical location. The multi-pronged approach, ranging from conduct of conferences, seminars, festivals, brainstorming sessions with all the stake holders, the celebrations of special scientific days, broadcast, telecast, webcast of scientific programmes, the launch of science OTT platform and



publication of books, booklets and science magazines, are creating a robust echo system for science communication, essential for creating scientific temper in the society.

The regular organisation of science film festivals in various parts of the country has been able to generate interest in filmmakers in science filmmaking. This together with conduct of science filmmaking workshops has created a pool of young science filmmakers across the country who can create video content. In the age of digital and social media the video content in regional languages will serve as an effective tool to reach ordinary Indian, most of whom are illiterate, with extra ordinary useful scientific content.

Vigyan Prasar's engagement with science teachers in rural India, especially with mobile teachers catering to nomad population of Gujjar and Bakerwal community, is fostering the science studies among the most disadvantageous.

In SCoPE in regional languages, Vigyan Prasar has adopted a bottom up approach by involving people from different parts of the country and reaching masses with useful scientific content in their

own language, using their own cultural and local settings. From electronic to traditional media and folk theatre forms, all means of communication are used to reach different stake holders. This multi-dimensional collaborative approach, involving multiple institutions from different fields at various levels and bringing together scientists, writers from different language and the communication experts, is resulting in generation and effective sharing of scientific knowledge in various regional languages.

Vigyan without Prasar is like the proverbial 'peacock dance in a forest' -what is not seen, cannot be appreciated. So Vigyan Prasar is humbly breaking the borders between scientific community and the ordinary Indian citizens, taking scientific knowledge to grassroots, that is bound to create a scientific temper in the society; resulting in a well-informed, healthy and prosperous society that thinks and acts scientifically. •

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**Prof. (Dr) Shahid Rasool**, a former US Fulbright fellow is currently Professor and Dean, School of Media Studies, Central University of Kashmir.

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# DREAM 2047: Journey of Three Decades

## Narottam Sahoo

The Total Solar Eclipse of October 24th, 1995 was a special one in that it happened on the day of the festival of lights and the path of totality passed over India at a favourable time of the day. It was Vigyan Prasar during those days who prepared a variety of resource materials to disseminate among students, teachers, science communicators, and common citizens in large numbers across the country.

I was doing my Ph.D. work at Regional Research Laboratory, Bhubaneswar at that time and was fortunate to have a solar spec of Vigyan Prasar, specially designed on a greeting card for Diwali saying, removing the darkness of superstitions with illumination of knowledge and wisdom.

We at Pathani Samanta Planetarium, Bhubaneswar, took the opportunity to work with Vigyan Prasar, Doordarshan, and All India Radio for their live coverage of the event at the crucial moments. For the first time, efforts were made by a Vigyan Prasar team to photograph the eclipse by chasing the Moon's shadow in an IAF plane AN-32 from the crew escape hatch on the roof of the cockpit at an altitude of 10,000 feet above sea level.

With excellent sky conditions in the morning, this celestial phenomenon provided a window comfortable enough to look through among millions of children and common citizens across the totality path as well as on Doordarshan and other arrangements.



That live program, as well as the interaction with members of the public and the media, influenced me to pursue a career in science communication and dissemination. Thanks to Vigyan Prasar for the very creative and resourceful materials and activity kits that inspired curiosity for lifelong learning and exploration.

The solar eclipse event was the stepping stone for me to climb upon to reach Vigyan Prasar in the successive events afterwards on a regular basis.

After completion of my research at RRL, Bhubaneswar, I went to the Homi Bhabha Centre for Science Education (HBCSE), of Tata Institute of Fundamental Research (TIFR), Mumbai, and that period groomed me to associate more often with Vigyan Prasar to design new activity modules and training programmes for my students at HBCSE and my communicator friends at Bhubaneswar, Odisha.

When I landed in Gujarat in October 2001, as a team member for the design and development of the Gujarat Science City, we strengthened our bond with Vigyan Prasar for each of the scientific occasions, events, and scientific exploration.

The Vigyan Rail at Ahmedabad Railway station during 2004 was another memorable programme as we had arranged for the maximum 1,00,000 visitors on a single day to be on the Vigyan Rail and to explore its 13-coach wonder world of science and technology.

Vigyan Prasar, an autonomous organisation under the Department of Science and Technology, has been working to kindle the public's interest in science by using physical and multimedia touch points.

Vigyan Prasar created a movement in each state/UT with its unique activity kits and resource materials for the International Year of Physics (2005), International Year of Planet Earth (2007), International Year of



Biodiversity (2010), International Year of Chemistry (2011), International Year of Light (2015), and so on. It was the binding tool for many to be attracted to science and, through VIPNET Science Clubs, to initiate a career in science communication.

Through GUJCOST and Science City, we had a series of programs and activities on VIPNET Science Club Meeting, National Biodiversity Camp, Science and Technology Communication via Digital Media, and Observation of Celestial Events such as Solar and Lunar Eclipses, Venus and Mercury Transit and so many programs, duly catalysed and supported by Vigyan Prasar. These programs are basically meant for the students, teachers and general public and underprivileged members who participate in thousands to get inspiration and insight into their lives and livelihoods.

Through the years, Vigyan Prasar has emerged as an institution of excellence that fosters dreams and cultivates wisdom, which is stimulating, inspiring, and rewarding. Vigyan Prasar has dedicated itself to the building of a "think tank" for national science communication and popularisation, and provides support for all sorts of strategic activities in the fields through theoretical studies.

Vigyan Prasar has consistently delivered scores of knowledge products, reached out to millions of fellow citizens, and added value to many national programmes. The institution and her staff are therefore poised to recognize, strengthen, and deliver ever more emphatically in emerging areas too; the logical way ahead.

The India Science News Feature Service, the India Science, Technology & Innovation portal, India Science Film Festival, Ham Radio, involvement with climate change communication aspects, tools, and techniques for the specially-abled and people in far flung / fragile areas, gender harmony and communication in disaster situations are many newer areas and projects in which Vigyan Prasar has ventured in for a greater cause.

The effort of Vigyan Prasar to promote science communication through regional languages has always been immense and is likely to grow further. It has started a flagship project called Science Communication, Popularisation and Extension (SCoPE) in Indian languages, which includes bringing of monthly popular science magazines to regular lectures on latest development and cutting edge research; from publication

of popular science books to harnessing social media to capture the imagination of youth; from producing television programmes to the latest science news.

Vigyan Prasar has given me values for a lifetime, and I have been working for the well-being of society. Today, I would like to convey my greetings and good wishes on the foundation day of the Vigyan Prasar and its dedicated team, that gave this nation prominent figures in the fields of science and technology promotion and popularization.

The future of our communities, our institutions, and the future of science and technology are inextricably linked. As we scan those horizons and set a vision for the future, we must demonstrate adaptable leadership, creativity, and courage, the way Vigyan Prasar has demonstrated for the last 33 years.

The creative, enthusiastic, and entrepreneurial approach of Vigyan Prasar is effective and relevant, meeting the pedagogy of science education and popularization and to take science to people and people to science. With a variety of programmes and activities, Vigyan Prasar is really encouraging the next generation learners and leaders to think scientifically and act scientifically to lead the future.

Let us celebrate the success stories of hope, passion, and resolve, together. The future of our science centres is bright, and working towards that future together is inspiring. Join us at the Vigyan Prasar science popularisation activities that fuel the state/nation take the stage. •

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**Dr. Narottam Sahoo** is a scientist by profession and science educator by training. He is presently working as the Advisor and Member Secretary in Gujarat Council on Science & Technology.  
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# An Agency With a Dream

## Kollegala Sharma

Vigyan Prasar. For a non-Hindi speaking person, Prasar meant publicity, and only lately I realized that it means communication. The thirty-two year old institution stands true for its name. I first came to know about Vigyan Prasar when Dr. Narender Sehgal, the Kalinga-award winner science communicator, and a dreamer, founded it. As a young science communicator I was in awe of his dreams. The people science movements that he catalyzed, and the Jan Vijnan Jatha that brought science to our doorsteps, and the NCSTC-network that he initiated had created a big buzz then. But there was a small doubt too. What can Vigyan Prasar do that the National Council for Science and Technology Communications could

not? The result is there for us to see. Initiatives to promote science in more than a dozen Indian languages, keeping pace with the times, engaging with new media and, of course, doing Scicom in a big way.

Dream 2047 that Dr. Subodh Mohanti edited in 1990s was a repository of history of science in India and elsewhere. Historical notes then were available only in peer reviewed journals such as Current Science and Indian Journal of History of Science. Accessing these then for a small town reader like me was impossible. But Dream 2047 changed that. We could get distilled information on history of science through the free magazine. And the bonus was a chance to learn Hindi. The bilingual newsletter has been useful in teaching the nuances of translating S&T texts. There is no other source that I could find to help

students understand this important aspect. And it is free! More so now in its digital form.

My direct association with Vigyan Prasar began when it launched the Radio Serials programme in late 2000s. Initially, Vigyan Prasar, planned to produce Radio Serials on Astronomy in various Indian languages. While scouting for an agency that could translation of radio scripts from Hindi to Kannada, I was approached to help. I got caught up in the enterprise. In the beginning we translated. But then some of us complained though the scripts were good, translation of some parts, especially the sprinklings of cultural aspects such as folk songs posed a problem. They sounded awful even with best efforts. So in a workshop organized by VP to review the programme

some of us suggested to provide only the backgrounder for content and let the local talents script the serial as they found suitable.

Normally, such drastic mid-course corrections are not accepted because of the logistical problems that ensue. But Vigyan Prasar is different. It saw the merit of suggestion, and from the very next serial the changes were implemented. The result: Instead of similar sounding radio plays, there emerged a variety of plays, in various formats creating a repository of examples. I was associated with the programme for five long years, and made friends in several non-governmental agencies, with science communicators of various other languages and with Prasar Bharati. Though I am not involved in the radio programmes any more, these associations have continued and have helped my efforts in science communications multiply.

Since then my association with Vigyan Prasar has been steady at different level. Wherever an opportunity for Science Communication is opened, Vigyan Prasar is quick to adapt. Even while organizing workshops, training programmes or other programmes, Vigyan Prasar has never hesitated to support new initiatives. One such initiative that we received support from Vigyan Prasar is Science Theatre. This aspect of Science Communication was lagging in Kannada, not because there were not enthusiasts, but the cost of doing it was overbearing. As a via media, Vigyan Prasar has a project, an inclusive one where troupes that produce Science Plays are being supported in performing them at various places. It is an effort where troupes perform, host institutions bear the local logistics cost and



Vigyan Prasar supports the troupes partly. This three-prong inclusive project was tested last year, and saw 18 performances of one single play in as many as 7 districts. Science Plays that depict serious discussions on science drew audiences other than the usual theatre enthusiasts. Educational institutions saw a new approach of getting students interested in science and started inviting the troupe to perform in schools and colleges. Without Vigyan Prasar's support this change could not have come so fast. More troupes are now interested in staging Science Plays based on the life and times

of scientists, new topics and even science fiction in Kannada.

For me, Vigyan Prasar is an institution that dreams of science communication in all aspects. My plans with other agencies to use new media and formats of science communication have only brought difficulties, but with Vigyan Prasar, it has only been an encouragement. And that makes it dear to me. •

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**Shri Kollegala Sharma** is a retired Chief Scientist of CSIR and a renowned science writer. He is a recipient of Government of Karnataka's VGST Award for Best Science Communicator, and Best Writer Award of Karnataka Science and Technology Academy. He also pioneered Science Podcast in India.

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# विज्ञान कथा

## প্রাণের খোঁজে

স্বপ্নের পথে  
আজকের বিজ্ঞান  
কাল্পনিক কল্পনা  
আজকের বিজ্ঞান  
কাল্পনিক কল্পনা

# विज्ञान कथा

## অনুসন্ধান উপদার্থবিদ্যা

স্বপ্নের পথে  
আজকের বিজ্ঞান  
কাল্পনিক কল্পনা  
আজকের বিজ্ঞান  
কাল্পনিক কল্পনা

# DREAM

## 2017

### EARTH DAY INVEST IN OUR PLANET

# DREAM

## 2017

### CELEBRATING THE NATIONAL SCIENCE DAY, 2022

#### C.V. RAMAN

# DREAM

## 2017

### VERA RUBIN AND THE MYSTERY OF HIDDEN DARK MATTER

# वि P अग्रिणीयलं व प्र परलकक!

## ஆல்பர் இன்ஸ்டீன்

# वि P अग्रिणीयलं व प्र परलकक!

## ബാലൻ കരണൻ റോബോട്ടിക്സ്

# گاش

## علم نشیات یکشنبه نفسانی عدد

# گاش

## ماحول رزشر اون عالمه پاپتہ اکہ پارچلیج

# కౌశల్యం

# కౌశల్యం

## కృతక ఊచి

# సక్కున

## వినయ, ప్రతిభ వాన దీక్షణలు ప్రతి వారమున

### వినయ, ప్రతిభ వాన దీక్షణలు ప్రతి వారమున

# సక్కున

## వినయ, ప్రతిభ వాన దీక్షణలు ప్రతి వారమున

### వినయ, ప్రతిభ వాన దీక్షణలు ప్రతి వారమున

# विज्ञान विश्व

## अंतराळवीर बना

# विज्ञान विश्व

## 5G गतीचे नवे आयाम

# विज्ञान रत्नाकर

## की आव विदा म रहल अति कोरोना?

# विज्ञान रत्नाकर

## అనుసంధాన కాలాండర్ ఆ ఆధారిత వైజ్ఞానిక

# విజ్ఞాన వనం

## The Calendar of Science

### విజ్ఞాన కాలాండర్ 2022

#### Chemiluminescence

# విజ్ఞాన వనం

## The Calendar of Science

### విజ్ఞాన కాలాండర్ 2022

# VIPNET CURIOSITY

## THE CALENDARS OF INDIA

### Incredible India's Incredible Astro-Psychicam

# VIPNET CURIOSITY

## JADAVPUR UNIVERSITY: CONNECTED TO SCIENTIFIC SPIRITS

# AN AUTOBIOGRAPHY OF THE MOON

## RAMESH SHISHU

# STORY OF CONSCIOUSNESS

## GOVIND BHATTACHARJEE

# VOYAGE TO ANTARCTICA

## AN ODYSSEY TO THE PAST, PRESENT AND FUTURE OF THE GELID MYSTERIOUS CONTINENT

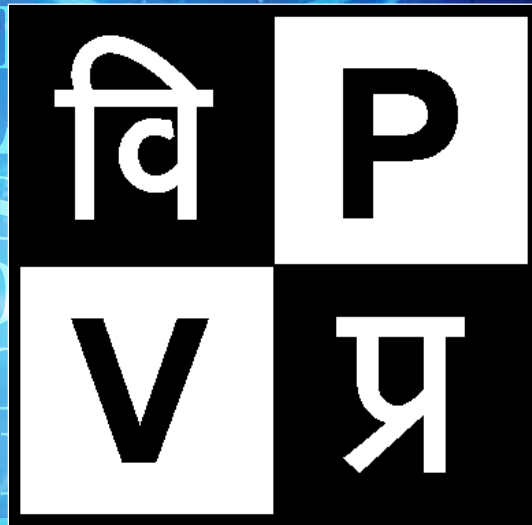
# STORY OF UNIVERSE

# भारतीय विज्ञान, प्रौद्योगिकी एवं नवाचार India Science, Technology & Innovation

## ISTI PORTAL

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Scholars and  
Scientists





# VIGYAN PRASAR

## SCoPE For All

Science Communication  
Popularisation & Its Extension

**VIGYAN PRASAR**

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