

# CSIR NEWS

ISSN 0409-7467



VOL 59 NO 21 & 22, 15 & 30 NOVEMBER 2009



## CSIR Foundation Day Celebrations

Founded in 1942, the Council of Scientific & Industrial Research (CSIR) completed 67 years of its dedicated service to the nation on 26 September 2009. The occasion was celebrated by the entire CSIR family of 37 institutes/laboratories, spread all over the country, with great enthusiasm. It was an occasion to celebrate the accomplishments of the year that has gone by and plan for the future to serve the nation with still greater dedication. It was also an occasion to accord recognition to excellence in science through the presentation of various awards.

Seen on the dais during the CSIR Foundation Day Function at Vigyan Bhawan, New Delhi (from left) are: Prof. Samir, K. Brahmachari, Director General, CSIR; Shri Prithviraj Chavan, Minister of State, Science & Technology and Earth Sciences and Vice President, CSIR; Shri Nandan Nilekani, Chairman, Unique Identification Authority of India (UIDAI); Dr Gangan Prathap, Director, National Institute of Science Communication & Information Resources (NISCAIR)

### Council of Scientific & Industrial Research FOUNDATION DAY CELEBRATION

26 September 2009





## CSIR Foundation Day Celebrations

*The main function of the CSIR Foundation Day this year was held at Vigyan Bhawan, New Delhi. The function, attended by the distinguished gathering of scientists and technologists was presided over by Shri Prithviraj Chavan, Minister of State (Independent Charge), Science & Technology and Earth Sciences and Vice President, CSIR, who gave away the various awards.*

Shri Prithviraj Chavan, Minister of State, Science & Technology and Earth Sciences and Vice President, CSIR, addressing the distinguished gathering said that the challenge before science today is to make significant improvement in the life of *aam aadmi*.



Quoting Pandit Nehru, Shri Chavan

said that it is science alone that can solve the problems of hunger and poverty. Congratulating CSIR for the multi-faceted achievements made in the field of Science and Technology, he stressed the need to convert our R&D units into innovation creating Institutes.

Shri Chavan said that today CSIR is 'Number ONE' institution in the country in terms of publications, patents and commercial earnings in terms of science and technology. He added that because of our robust and appropriate economic policy being followed since 1991, we could withstand the pressure of the global melt down in 2008 and sustain our growth rate.

"If India has to become a truly global power, it will be through its manpower, which is properly trained and is second to none," said Shri Chavan. "We are funding colleges to create biotechnology centres, we are also creating National Research Universities that has been the vision of the Hon'ble Prime Minister Dr Manmohan Singh," he further informed. He called upon CSIR to help developing scientific temper among the general populace.

Shri Prithviraj Chavan gave away prestigious CSIR Young Scientist Awards, CSIR Technology Awards 2009 and CSIR Diamond Jubilee Invention Awards for School Children 2008.



Prof. Samir K. Brahmachari, Director General, CSIR, extended a warm welcome to Shri Prithviraj Chavan, Shri Nandan Nilekani, and all the other distinguished invitees, including farmers who collected the seeds of 'Ashwagandha' from the hands of Minister.

Prof. Brahmachari also announced the winners of this year's Shanti Swarup Bhatnagar Prizes.



# CSIR Foundation Day Celebrations



Shri Nandan Nilekani, Chairman, Unique Identification Authority of India (UIDAI), delivered this year's CSIR Foundation Day Lecture, titled, 'Unique Identification Project, Challenges and Issues'.



Dr Gangan Prathap, Director, National Institute of Science Communication & Information Resources (NISCAIR), New Delhi, proposed the vote of thanks.





# CSIR Foundation Day Celebrations



Farmers from Anantpur, Andhra Pradesh; Najafgarh, Delhi; Rajkot, Gujarat; Bhiwani, Hisar, Haryana; Nagpur, Maharashtra; Jhunjhunu, Rajasthan with Shri Prithviraj Chavan, Prof. Samir. K. Brahmachari, Shri Nandan Nilekani and Dr Gangan Prathap.



The Minister released a monograph on *Ashwagandha*. *Ashwagandha* is an important Indian Medicinal Plant described extensively in the text of Ayurveda



The Minister handing over a packet of *Ashwagandha* seeds to a farmer



Under the NMITLI Project taken up by CSIR, NMITLI 118, a new variety of *Ashwagandha* has been developed. The new knowledge created on *Ashwagandha* is collected in the form of a monograph



## CSIR Foundation Day Lecture

### Unique Identification Project: Challenges and Issues

**Shri Nandan Nilekani, Chairman, Unique Identification Authority of India (UIDAI)**

**M**r Prithviraj Chavan, Dr Brahmachari, Dr Prathap and distinguished scientists of the CSIR family, it is really a great pleasure and an honour for me to be here today on the 67<sup>th</sup> Foundation Day of CSIR to give the Foundation Day Lecture. I am grateful that I have been given this opportunity to share with you our ideas and strategy for the Unique ID. I look forward to a very healthy partnership with all of you to make this Project happen.

In the next few minutes I will essentially explain to you what this unique ID will do; what this ID is all about and also what it means in terms of its implication technologically, the scale of the problem and so forth. I will also talk about why this project will need a lot of innovation and also a lot of different kind of thinking to make it happen.

There is a lot of misconception about what is our role. What is the challenge of identity that we have in this country? What are the inclusive benefits that can flow from doing something like this? What is our approach? How do we intend to do it? What are some of the technological challenges that we face and how do we intend to overcome them? What are the risks that we have and what are the goals

that we have set for this project?

The first important thing is that we will issue numbers and not cards. There is a lot of talk about cards but fundamentally, we will be issuing a number to every Indian resident. These numbers will be stored in one central database where for every resident there is a record. A part of this record will be basic demographic information like name, address, date of birth, father's name and mother's name etc., while the other part will be a biometric set of information. There are many possibilities with biometrics as you can use fingerprints as well as DNA. We will be finalizing the exact set of biometrics we will be using; probably a combination of fingerprints and a picture.

The important thing is that today in all our identity databases, we have a huge amount of duplicates and ghosts. If you look closely, you will find that there are dead people still holding cards. This is the root of our problems. What we are trying to do with centralized database and biometrics is to make sure that there are no duplicates. This is the key paradigm shift that I am talking about, which is: How do we make sure that there are no duplicates in this database and that there is just one record per person and just one number per person? We



Shri Nandan Nilekani, Chairman, UIDAI, delivering the CSIR Foundation Day Lecture

will be using biometrics to do so. We think that with biometrics combination we can uniquely identify the person. But that still needs to address the issue of duplicates.

Therefore, when a person gets enrolled in the database, we will do a scan of the existing records in the database to see if an identical record exists for that biometric pattern. This is called *one:n* search. This means that we look to see if there is already someone in the database with that biometric pattern. If we find somebody in the



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database with the same biometric pattern we will reject that person. This will control duplication at the point of entry. We hope to ultimately build up a tank of entries, with standardized attributes, over a billion names without any duplicates. This is the key to the whole thing.

This database is a very simple database. It has just about a dozen fields and the biometrics. It does not have any profiling attributes. It does not have any transactions. It is just one tank full of names. What is important is that we propose to offer online authentication of identification against this database. In other words, anywhere in the country, if somebody needs to verify somebody else's identity — say the need is to confirm for a bank branch that a person claims to be one's own, all that needs to be done is to take the person's thumbprint/ fingerprint and through the mobile phone the thumbprint and ID number can be sent to the database. Within a few seconds, we will confirm the identity.

Online authentication of identity will be available on the cell phone network! This would be a very important thing because it essentially means that as the cellphone network travels along, the authentication network will travel with it. Since the person's authentication is based on fingerprints there is no need for documents or identity papers such as a passport to be carried around all the time.

This is a unique thing because we are not aware of any place in the world where there is online authentication of identity done the

way we propose and this, we think is very, very important. It opens up a lot of opportunities for us to do things differently. Also, this database will not send the name or address of the person because we think it will be an invasion of privacy. All we will be doing is to send a signal saying "Yes" or "No." So basically when you send us the query with a photograph and a fingerprint; we will just say "Yes" or "No". Fundamentally, online authentication over the mobile network is a very critical piece of this puzzle.

Now, what we find today in India is that verifying identity is a common challenge, whether it is issuing ration card or issuing an LPG cylinder connection — everywhere we have the same challenge of identity verification. The questions asked are: "Who are you?" "Are you the person you claim to be?" Because we do not have a consistent way of doing this, we use all kinds of proxies. We ask them for a ration card and we ask them for a birth certificate...and so on. The documents themselves become the proxy for identity, but as you know, documents can be created. This means false documents can be produced.

Secondly, the poor in the country have the weakest form of documentation because they do not have a proper address/birth certificate/school leaving certificate etc. Therefore, it is the poor in this country who have the biggest problem in identifying themselves and as a result, face the greatest harassment when they need to prove their identity — as for example,

when they want to open a bank account or a ration card. As we can provide a low cost, reliable way of verifying identity, we could unlock opportunities for all the people in the country.

Our job is only ID-verification. It is a very simple system. However, having a valid ID number in the database is not a guarantee of any rights or entitlements or benefits. It does not confer residency status or nationality. All it does is to say, "X is X! We will confirm that for you." That is all we do. It then becomes the responsibility of the different agencies to use this verification along with the other lines of verification needed for their line of business. For example, if you are the Ration Card Authority and you want to make sure that the BPL card is issued only to persons earning below a certain income level; that check you have to do. If you are the Passport Authority, and you need to have a police verification done before you issue the passport, you will have to get it done as a part of your process. As Election Authority you have to verify a person's address yourself. All those additional things which are context-specific to a particular application have to be done by the concerned party. All that we do is to verify that, "X is X!"

Who gets this number? All residents of India, including infants, will get this number. However, the challenge with infants is that their biometrics are not fully formed. The fingerprints are either too small or not fully formed. The general belief is that you have to be an adult before your biometrics are fully formed. To cover infants, therefore, we will be



keeping a proxy, which will be the mother's or the guardian's Unique ID. The database will use that as a proxy because we want to include even the babies in the database.

We will give the UIDs to everybody. What is important is that from the UID perspective this is a voluntary number. In other words we do not force anyone to take this number. What will happen is that as we interact with more and more applications; those applications will expect you to have a UID number. For example, at some point in the future, when you go to get a passport, you will be expected to have a UID number. The PAN card will expect you to have the UID number. At some point you will need your UID number to access your biometric bank account. So over time, across the country, different agencies will be using the UID number as the basis for verification. Automatically, more and more people will get this number.

This number will remove the cloak of anonymity as everybody would be identifiable in the long run. As I have said, identification is a very powerful thing and it will help the poor and the marginalized to get better access. It also enables direct benefits because once you can identify the beneficiary there are ways by which the benefits may reach him directly. Therefore, the whole concept of direct benefits, cash transfers etc., are enabled by this technology.

We also hope to have a special programme to reach out to marginalized groups because they often have the most difficulty in getting ID. We intend to work with

civil society and NGOs to reach out to different groups of people such as those differently-abled or say, rickshaw pullers or farmers or fishermen. We will try to include all of them into the system so that all of them are numbered. We believe that with this nationally-enabled online authentication, your mobility will improve. You can move from one part of the country to another and get yourself verified wherever you are! Therefore, it will improve your access to opportunity.

It is very important to enhance our flagship schemes. The Government of India has many flagship schemes such as the NREGA, *Sarvashiksha abhiyaan*, NRHM — all these schemes are essentially directed towards giving benefits to the people. These can be enhanced with UID verification because you can then reach the people directly. Moreover, cases of duplications where people who do not exist but claim benefits will reduce as only people with UIDs can claim the benefits. This will help in bringing about administrative reforms. It will also strengthen security because everybody will have a number and it will authenticate who he or she is.

In the last few years, there have been several projects which have tried to look at how this could be done. The Planning Commission used to have a process by which they used to take existing databases and bring them all together. Out of all these approaches we have taken what we think is a stable approach, which is a demand-driven model where we will use partners who will act as 'acquisition partners' to get

the numbers we have to give out. To put it in another way, we will just be the backend which has this database and the facility to make sure that there are no duplicates. The actual number happens when an Indian resident comes to some agency for a service. That is say, you need a passport and you do not have an UID, then you get enrolled at that point. So, essentially all our registered partners will be points of entry. This way enrolment will happen and will leverage the power of so many agencies. See today banks have so many accounts and mobile companies have so many subscribers. We could use insurance companies too. We will plug in our software into their models so that we enrol them as a by-product of the service they provide. Really it is about creating an ecosystem in which everybody participates. We will have multiple registrars and in turn, they will have multiple touch-points where they touch individuals who come to them for business. It works both ways.

We think UID verification will be demand-led. In other words, the kind of ecosystem that we will create, people will want this number. The number will be the key to the many benefits that they will get. It will make it easy for people to demand their rights. Therefore, people will come forward for this number. Another reason why we think this number is different is that once you enrol for the number — it is lifelong. Today if you go to seven agencies you have to prove who you are, seven times. With this model you are enrolled just once and your identity is authenticated



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everywhere.

We think this will help in two ways. It will help reduce consumption cost in the system because you do not have to do authentication over and over again. Secondly, the poor will find it very inclusive. Once people realize that there is just one record for them in the database, then they will make sure that the data in the database is correct. If there are duplicates then there are all kinds of gaming. However, if there is only one record; it is in your interest to keep that record clean. That is why we think this is a self-cleaning system. People will have to have clean information about themselves. Fundamentally, it will be something good for people. People will want to have it.

It is also good for the registrars, for it will reduce leakage ensuring that the benefits will go to the right people. It will also reduce the amount spent on establishing identity that is the Know Your Customer (KYC) cost. It is all about inclusivity. The key is common enrolment. Irrespective of how the person enters the system — via the NREGA, Passport Office or Banks — enrolment will be done the same way. It will have the same fields, the same checks, the same biometrics and the same verification process. What we are creating is a cooperative database. Many people are pouring data into it so we have to make sure that everybody plays by the same rules so that the quality of data is maintained. We will be giving a piece of our software to our partners which will be used for enrolment. This piece of software will have to be plugged into their

applications so that it follows our process.

The important thing is that our partners, that is say, Income Tax Department or NREGA or the Passport Office will have full flexibility in how they will use the number. They can do the basic verification that we do and do additional verification based on their applications—for example income verification before issuing the BPL card. They can use our number as the key; they can use a smartcard or a barcode. We believe that having such a flexible, open architecture is very important for our registrars to adopt the UID process.

We will assure data-field standards, that is, names will be collected the same way; addresses will be collected the same way and so on. We will have verification standardization. We will have enrolment standardization. We will have biometric standardization. We will be creating a platform which everybody can use. So everybody will have to use the same standards. Standardization is the key to making this inter-operable. We will publish a set of documents and processes on what our partners have to do to make their systems ready for UID. They have to make certain changes in their internal systems before they can plug into the UID. We will publish it up front so that people can read it and get ready for UID.

We think that with this approach we will have a bell-shaped curve. People will start getting enrolled and as more and more people get enrolled, agencies will tie up with us and pour more and more names into the database. It will have a

ramp-up. Then the ramp-up will slow down because once you have got your UID through one channel, the demand will start tapering off. Then we will have to address the issue of getting the last few hundred million people of the country. That will take some time. It will be difficult to reach all the parts of the country and may be, we will seek CSIR's help on that. In this model, the more names there are in this database the more useful it becomes. So it follows what is known as the Law of Increasing Returns or the Network Effect.

We will also have a strategy to enrol entire families. This is all about inclusion. It is about giving people the chance to participate. So it has to be easy to get people into the system. We will have a verification process that is sensitive to the fact that some people do not have a lot of documentation. As we have to be inclusive, the process has to be quite liberal in allowing people to register. The good news is that once somebody registers, he has only one entry in the system as he cannot come in twice. Not having duplicates is a fundamental paradigm change.

On August 20<sup>th</sup> we announced a tie-up with NREGA. They intend to use the UIDs on the job cards and bank accounts so that it becomes easier for them to give jobs and pay their workers. We have a partnership with the RGI that does the census, what is coming up in a couple of years. They intend to collect data in a common format so that we may also use it for verification. We will provide multiple authentication methods.



Over time, UID adoption will help in improving delivery systems. It is a huge lever that we can use to improve the public delivery of our system. UID, over time will, build a business model that will charge for some of its activities. For example, if a bank wants an address verification, we will levy a small charge for that. We hope to be able to cover the cost of operation but that will take quite a bit of time.

UID verification will be one of the most technologically complex operations in the world. We are planning to have 1.2 billion people in this biometrics based system. This means that it will be ten times larger than anything currently running anywhere in the world. So this is the first step in the large, uncharted area of challenges.

We have also found that one biometric is not enough. We have to do what is called multi-modal biometrics. So we will have to use both fingerprint and face, may be iris scan and so on and so forth. We also face a challenge as children will not have the desired biometric pattern in our system. This would also include people like agricultural workers whose fingers have been affected by working in the fields and have erased fingerprints.

We have the challenge of enrolment. How do you get a billion people all across the country into the system? How do you make sure that enrolment everywhere is done according to the same standard? Everybody must give the fingerprint of ten fingers and everybody must give a picture with the same lighting at the back. This has to happen in six hundred thousand villages and

all this has to happen accurately. This is a huge challenge. Nowhere in the world has such a large number of people been captured using biometrics. We expect to face a lot of challenges while going forward.

This is also the first time that we will be doing biometric re-duplication on such a scale — it is a huge computing challenge. Let us assume that 3 or 4 years down the line, we have four hundred million records in the database. Let us suppose that now three million people claim that they do not have UID number. So each of those three million people will have to be checked against the entire database to check duplication. We have to do it in 15-16 hours, because the next day we will get another three million people. The volume and the flow of taking three million people and running a  $1:n$  duplication check is a hugely computer-intensive problem. We will need massive parallel processing. We have to make sure that the architecture is ready for doing transactions of such a magnitude.

We have to see what kind of technology, what kind of algorithms and what kind of softwares we will need for this purpose. What is going to happen is that at the peak we will be having a large database to be searched as a large number of records will be coming in. At the end we will have a lot of records in the database but not many new enrolments will be there. It is in the



middle that we will have both a large database and a large number of new enrolments. This is the peak load and we will have to design for that peak load because otherwise we will not be able to provide authentication to the registrars who are pumping in names.

We are doing different things. We are trying to introduce filters — biometric filters, composite vectors, graphic GPUs, custom-built gate arrays, looking at different kinds of index-hashing algorithms, and may be even looking at the locality of reference. What this means is that if you are in say, Haryana we look at the residents in Haryana only because we assume that the person will not go across the native State. There are many things we have to think about. But it is certainly one of the biggest technical challenges in the world. How do we create the architecture for the massive parallel processing to make sure we carry out the searches simultaneously? What kind of cloud computing will we need to have?

Remember we are talking about online authentication, as anyone, anywhere in the country can do the authentication. We cannot predict the load of online authentication that



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will come. So we need to have virtualization of the architecture for that. We will have to have in-memory databases so that your search time is reduced. Again, that is a massive challenge. It is actually about the need to read many kinds of applications where you enrol only once but in one's lifetime there may be thousands of verifications. So the architecture will be very different from how you design a transaction architecture.

Remember, we want to offer online authentication over the cell phone, which means the transaction has to be very, very low cost and low on communication load. An uncompressed fingerprint takes up 1 MB. Now if you start sending 1 MB files up and down a cellphone you will have a problem. If you compress it you get to 500 kb, but then may be you need to do further extraction of the key points of the fingerprints and send a 200 kb file. So there is a massive compression challenge to ensure that what we send for verification on the cellphone network — the package — is as small as possible. Otherwise the cellphone network will choke. It is a huge challenge to find out how we can do this on a mobile network. Then you may be having enrolment happening where there is connectivity but how do you work offline and then upload the batch? Then, how do we use existing infrastructure? There are a lot of issues on the network side.

There are also security issues and authentication issues to be figured out. We also need fraud-detection ability because that is a big challenge in all these systems.

We will need automatic alerts for suspicious behaviour.

The challenge in the field is next. For example, the same name is spelt in different ways across the country. We do not have address standardization. We do not have a proper addressing system. We have to provide local language support. At the same time, we need a database that can be searched universally. So you need local language support as well as a common language to search universally. There are a lot of complexities that need to be sorted out.

This project is a big project. It is not an easy one. It is a challenge of scale of getting a billion people into the system. It is a challenge of designing for privacy and security. It is a challenge of adoption — how do you make sure that the different agencies use this number to improve the quality of governance. It is a challenge of enrolment and standardization across six hundred thousand villages. It is a challenge of politics because all this will have implications. How do we sustain this? How do we ensure this project sustains momentum? This is a very, very large and complex project. We all have to manage multiple risks.

In the last few months since the Authority has been set up, we have met all the stakeholders who deal with giving people ID — Passport Office, Income Tax Office, NREGA, banks etc., and all have been ready, for this in principle. They all said, “Yes, we need something like this because we are all facing the common challenge of verification.” The good news is the whole-hearted

support that we have received from all the Ministries, all the regulators like SEBI, RBI, TRAI etc. We are now going and meeting all the State Governments and seeking their support.

Recently, we met the entire Telecom Industry, the Banking Industry, and the entire IT Industry to seek their support. This is all about creating a climate of opinion that all people want this number. So what is the goal here? Our goal here is that in the next 12 to 18 months we want to issue the first set of UIDs and four years from then, approximately five years from now, we want to issue six hundred million UIDs. We cannot do this alone. It has to be done by everybody pitching in and making sure there is a sense of urgency on enrolment. This is the broad story of what is coming down the pipe in UID.

We think it is very important for India to do this project because lack of identity is the reason why the poor and marginalized are being left out of the development in this country. We seek and welcome the huge intellectual brainpower of CSIR. We want to know how you feel that you can contribute, whether it is in helping to build the applications or on adoption. May be you will have large people samples where you can use this. We will be giving this to you as an open platform and you can build your applications on top of our platform and create innovations of any kind that you want. I look forward to a lot of support from the CSIR community because this is an important project to make a transformational difference to the country. Thank you very much.



## Shanti Swarup Bhatnagar Prize 2009

Instituted in 1957, the Shanti Swarup Bhatnagar Prizes are the most coveted S&T Prizes in the country. These Prizes, each carrying a cash award of Rs 500,000, a citation and a plaque, are awarded annually for notable and outstanding research, applied or fundamental, in (1) Biological, (2) Chemical, (3) Earth, Atmosphere, Ocean and Planetary, (4) Engineering, (5) Mathematical, (6) Medical and (7) Physical Sciences. Any citizen of India engaged in research in any field of Science and Technology, who is not more than 45 years old on 31 December of the year preceding the year of the Prize, is eligible. He/she should have made, in the opinion of CSIR, conspicuously important and outstanding contribution to human knowledge and progress — fundamental or applied — in the particular field of endeavour, which is his/her specialization. The Prize is awarded on the basis of contributions made through work done primarily in India during the five years preceding the year of the Prize.

Eleven scientists, listed below, have been selected for the Shanti Swarup Bhatnagar Prizes for the year 2009:

### Biological Sciences

**Dr Amitabh Joshi**  
Evolutionary & Organismal  
Biology Unit,  
Jawaharlal Nehru Centre for  
Advanced Scientific Research,  
Jakkur P. O., Bangalore 560 064

And

**Dr Bhaskar Saha**  
National Centre for Cell Science  
(NCCS), Ganeshkhind,  
Pune 411 007

### Chemical Sciences

**Dr Charusita Chakravarty**  
Department of Chemistry  
Indian Institute of Technology,  
Hauz Khas,  
New Delhi 110 016

And

**Dr Narayanaswamy Jayaraman**  
Department of Organic Chemistry,  
Indian Institute of Science,  
Bangalore 560 012

### Earth, Atmosphere, Ocean and Planetary Sciences

**Dr S. K. Satheesh**  
Centre for Atmospheric and  
Oceanic Sciences,  
Indian Institute of Science  
Bangalore 560 012

### Engineering Sciences

**Dr Giridhar Madras**  
Department of Chemical  
Engineering  
Indian Institute of Science  
Bangalore 560 012

And

**Dr Jayant Ramaswamy Haritsa**  
Supercomputer Education &  
Research Centre  
Department of Computer Science  
and Automation  
Indian Institute of Science,  
Bangalore 560 012

### Mathematical Sciences

**Dr Venapally Suresh**  
Department of Mathematics  
and Statistics,  
University of Hyderabad  
Hyderabad 500 046

### Medical Sciences

**Dr Santosh Gajanan Honavar**  
Head of the Department,  
Ocular Oncology  
L. V. Prasad Eye Institute  
L. V. Prasad Marg, Banjara Hills,  
Hyderabad 500 034

### Physical Sciences

**Dr Rajesh Gopakumar**  
Department of Physics,  
Harish-Chandra Research Institute,  
Chhatnag Road, Jhusi,  
Allahabad 211 019

And

**Dr Abhishek Dhar**  
Theoretical Physics Group,  
Raman Research Institute,  
Bangalore 560 080



## CSIR Young Scientist Awards 2009

Introduced in 1987, these Awards are open to scientists working in CSIR system who have not attained the age of 35 years by 26 September of the preceding year. The awards are given annually for outstanding contributions made by the young scientists, based on work done primarily in India, in the following fields: Biological Sciences; Chemical Sciences; Engineering Sciences; Earth, Atmosphere, Ocean and Planetary Sciences and Physical Sciences (including Instrumentation). The scientist should be a regular employee of CSIR, holding a post of Group IV (Scientist 'B' or above) and should have joined the CSIR laboratory on or prior to 26 September of the previous year. The Awards carry a citation, a plaque and a cash prize of Rs 50,000. CSIR Young Scientist Awardees are also entitled to a research grant of Rs 5.0 lakhs (Rupees five lakhs only) per annum for a period of five years and an honorarium of Rs 7500/- (Rupees seven thousand five hundred only) per month till the age of 45 years.

The recipients of the CSIR Young Scientist Awards for the year 2009 are as follows:

### Biological Sciences

**Dr Fayaz Ahmad Malik**  
Department of Pharmacology,  
Indian Institute of Integrative  
Medicine, Canal Road, Jammu

Dr Fayaz Ahmad Malik has been  
awarded for his excellent work

related to the development of anti-  
cancer herbal formulations from  
Indian Medicinal plants along with  
their mechanisms of action.

### Chemical Sciences

**Dr Srihari Pabbaraja**  
Organic Division, Indian

Institute of Chemical Technology,  
Uppal Road, Hyderabad

Dr Srihari Pabbaraja has been  
awarded for his contribution  
towards the total synthesis of  
biologically active lactone  
containing natural products and  
development of new organic  
procedures.



CSIR Young Scientist Awardees with Shri Prithviraj Chavan, Prof. Samir K. Brahmachari, Shri Nandan Nilekani and Dr Gangan Prathap



## Engineering Sciences

### Dr Balaraman Madhan

Centre for Human & Organizational Resources Development, Central Leather Research Institute, Adyar, Chennai

Dr Balaraman Madhan has been awarded for his significant contribution to our understanding of tanning and the potential impact of this research on biomedical applications.

## Earth, Atmosphere, Ocean & Planetary Sciences

### Dr K. V. Ramesh

CSIR Centre for Mathematical Modelling and Computer Simulation, Bangalore

Dr K. V. Ramesh has been awarded for his significant contribution to the understanding of Indian summer dynamics (monsoon and variability).

### Dr Nimisha Vedanti

Fractals in Geophysics Group, National Geophysical Research Institute, Uppal Road, Hyderabad

Dr Nimisha Vedanti has been awarded for her outstanding work in the field of 4D seismic and inversion that had helped to optimize production strategies in low producing Indian oil fields.

## Physical Sciences

### Dr Debi Prasad Das

Process Engineering and Instrumentation Cell, Institute of Minerals and Materials Technology, Bhubaneswar

Dr Debi Prasad Das has been awarded for his significant contributions to active noise control by means of efficient algorithms, in particular the work on fast multi-channel FSLMS algorithms. His work on underground coalmine communication systems is also commendable.

## CSIR Technology Awards 2009

Instituted in 1990 'CSIR Technology Awards' seek to foster and encourage multi-disciplinary in-house team efforts and external interaction for technology development, transfer and commercialization. These Awards include one each for: (i) Life Sciences; (ii) Physical Sciences including Engineering; (iii) Innovation; (iv) Business Development and Technology Marketing; and (v) Most Significant CSIR Technology of the Five-Year Plan Period (awarded once in five years, coinciding with the plan period, to such technology which has proven in the market place atleast for five years).

Each Technology Award comprises of a cash prize of Rs 2 lakh except the award for the "Most Significant CSIR Technology of the Five-Year Plan Period" which has a cash prize of Rs 5 lakh. Besides, a plaque and a citation is also given to the awardees.

For the year 2009, two awards out of the available five are being given, following a very stringent criterion so as to maintain high standard set for the Awards. They are in the category of 'Physical Sciences including Engineering and 'Innovation'.

The Technology Award for Physical Sciences including Engineering goes to the Indian Institute of Petroleum, (IIP), Dehra Dun, for developing Innovative technology for upgrading fuel oil components into premium refinery products.

Developed process technology is based on an innovative concept of combining two distinct and unrelated disciplines i.e. 'solvent extraction' and 'catalytic cracking'. The process provides improved quality de-aromatized feed (raffinate) for secondary conversion unit i.e. Fluid Catalytic Cracking (FCC). Developed technology helps in reducing catalyst consumption, load on FCC catalyst regenerator and CO<sub>2</sub> emissions and is poised to help in meeting future carbon emission legislations of the refinery. The process is easily adoptable by a refinery which has conventional lube refining facility and does not require major additional investment for setting up of any new units.

The technology is licensed to M/s Hindustan Petroleum Corporation Limited (HPCL), Mumbai. Commercial operations have increased annual profit of the refinery to the tune of Rs 87.6 crore.



## CSIR Foundation Day Celebrations

The Technology Award for the 'Innovation' goes to the Central Drug Research Institute (CDRI), Lucknow, for development of synthetic endoperoxide anti-malarials as substitute to artemisinin derivatives. The innovation involves the development of an easily accessible, low cost

synthetic and safe endoperoxides compounds as substitute for currently available semi-synthetic artemisinin derivatives such as artemether, arteether and artesunic acid. Extensive biological evaluation have led to the identification of two most promising molecules. Pre-clinical development of these

potential anti-malarial compounds has been completed in collaboration with IPCA Laboratories, Mumbai. One compound is currently under Phase-I clinical trials at PGIMER, Chandigarh. International patents have also been obtained for the innovation.



Winners of CSIR Technology Award with Shri Prithviraj Chavan, Prof. Samir.K. Brahmachari, Shri Nandan Nilekani and Dr Gangan Prathap

## CSIR Diamond Jubilee Invention Awards for School Children 2008

In order to enhance creativity amongst school children, CSIR announced for the first time Diamond Jubilee Invention Award for School Children on 26 April 2002 — the day celebrated as World

Intellectual Property Day throughout the world. The objectives of these Awards are to capture creativity and innovativeness amongst school children and create awareness about IPR.

There are a total of 60 Awards to be given each year. The first prize winner becomes eligible for WIPO's Young Inventor's Award carrying a medal and a certificate besides cash prize of Rs 50,000/-.



During the last seven years, i.e. from 2002 to 2008, 2583 proposals were received for these Awards from various parts of the country and 46 inventions were selected for various prizes by a High-Level Awards Selection Committee.

During the year 2008, only five inventions were selected out of 362 proposals for the various categories of prizes out of a total of 60 prizes to be given. During the year 2008, no first prize was given.

Five Awards were given to the winners of 'Seventh CSIR Diamond Jubilee Invention Award for School Children 2008' on CSIR Foundation Day 2009. The winners received a cash prize, trophy and a certificate.

The prizes given were as follows:

A single Second Prize of Rs 25,000/- has been awarded to Miss Neha Lalit Sharma, student of Class XI of Swami Vivekannand Junior College, Chembur, Mumbai for her invention, 'A Novel Writing Aid (LIPI-Letting Infirm to Pen their Ideas)'.

A single Third Prize of Rs 15,000/- to Master Harjas Singh Sodhi, student of class VIII of Modern School, Barakhamba Road, New Delhi for his invention, 'A Novel Fingerprint Detecting Composition based on the Food Dye Tartrazine'.

Three-Fifth Prizes of Rs 5000/- each were awarded to:

i) Master Shikhar Bhandari of

class XII of B.V.B. Mehta Vidyalaya, K.G.Marg, New Delhi for his invention, 'Manual Battery Charging Device'.

ii) Master Vishakh Hegde, student of class XI of V.V.S. Sardar Patel Pre-University College, Basawerawarangar, Bangalore, for his invention, 'A Novel Low Cost Automatic Warning System for High Speed Winds'.

iii) Master V. Pranav of class IX of Atomic Energy Central School, RMP Colony, Yelwal, Mysore, for his invention, 'Anti-algal/fungal and anti-bacterial Material'.



Winners of the CSIR Diamond Jubilee Invention Award for School Children with Shri Prithviraj Chavan, Prof. Samir K. Brahmachari, Shri Nandan Nilekani and Dr Gangan Prathap



### CSIR Foundation Day Celebrations at Laboratories/Institutes

All the 37 CSIR Laboratories/Institutes celebrated the CSIR Foundation Day on 26 September with great enthusiasm. They took stock of the performance of the past year and planned for the future. Special programmes were arranged on the occasion. The staff members who had completed 25 years of regular service and those who had retired since last Foundation Day were honoured by presenting mementoes and shawls. Various competitions were organized as a part of the celebrations and winners were awarded. The occasion was also observed as Open Day by many Institutes/Laboratories and a large number of people, particularly the students, visited and interacted with the scientists. The programmes organized on the occasion at CBRI, CECRI, CIMAP, IMTECH, NAL, NGRI and NPL are highlighted below:

#### Central Building Research Institute (CBRI), Roorkee

CBRI observed 'Open Day' on 26 September 2009 to commemorate the 67<sup>th</sup> Foundation Day of CSIR. The Institute was left open to the public and invitations were sent to schools to send their children to interact freely with the scientists of the Institute.

Prof. Prem Krishan, former Professor, IIT, Roorkee, graced the occasion as Chief Guest and congratulated scientists and staff members of the Institute for carrying out various R&D programmes concerned with the Building Science & Technology. The R&D work of CBRI has benefited the society, particularly the rural people of the country. Prof. Krishan said that the Nation is indeed proud to have an organization like CSIR in the Indian sub-continent under the aegis of the Ministry of Science & Technology. He further drew attention on the problem of global warming. Prof. Krishan emphasized that the scientists in the Institute should choose a few focal areas and work towards achieving excellence in those areas. "If you have such excellence, people from all over the



Seated on dais (from left) are: Shri S.C. Tyagi, Shri M.P. Singh, Prof. Prem Krishan and Prof. S.K. Bhattacharyya

world would come to you," said Prof. Krishan.

In his Inaugural Address, Prof. S. K. Bhattacharyya, Director, CBRI welcomed the Chief Guest and highlighted the Institute's R&D activities. He informed that CSIR has always received due importance and appreciation by its President, the Prime Minister of India and Vice President, the Hon'ble Minister of Science & Technology and all those familiar with the contributions of

CSIR. He apprised that the President of CSIR, Hon'ble Prime Minister of India, Dr Manmohan Singh, complimented the role of CSIR in the overall development of the country. Prof. Bhattacharyya further informed that the President, CSIR, has great expectations from CSIR as he has asked scientists to contribute to the Common Minimum Program and CBRI has to play a major role.



Prof. Bhattacharyya expressing satisfaction at the achievements of CSIR scientists added that CBRI is one of those labs which is directly concerned and connected with the upliftment of common man because shelter is considered as one of the basic human needs. CBRI has

always played a vital role in finding appropriate solutions for providing houses and buildings to meet the aspirations of the people of this country, he further said.

On this occasion the retired persons and the employees who had served CSIR for 25 years were

honoured. An essay competition on *Water Conservation* was also organized by CBRI for the staff children. The Function ended with the vote of thanks proposed by the Controller of Administration, Shri Subhash Chand Tyagi.

## Central Electrochemical Research Institute (CECRI), Karaikudi

At CECRI, Dr H. Sivaramakrishnan, President (Research), M/s Piramal Life Sciences Limited (PLSL), Mumbai, was the Chief Guest, who delivered the Foundation Day Lecture on, '*Collaboration for Invention – Perspective of an Industrial Scientist*'.

Dr Sivaramakrishnan began his

lecture with a remark that the average life expectancy of human beings in India has vastly improved from 38 years in 1953 to 62 years in 2009. He highlighted the R&D contributions and the active role of Pharma Industries for this remarkable achievement. He explained the various pathways for

drug discovery and the difficulties in commercializing a drug molecule. The drug molecule has to pass through a number of screening stages, such as pre-clinical tests, field testing in different phases and then it has to be cleared by regulatory control agencies. The process of launching a drug





## CSIR Foundation Day Celebrations

molecule into the market from its discovery and patenting is a long, arduous one often stretching more than about 15 years. Though many new drug molecules are reported, only a few of them pass through the rigorous screening and ultimately hit the market.

Dr Sivaramakrishnan mentioned that for the invention of new drug molecules, the money spent on R&D by various nations at the global level is very high. In this context, he emphasized the need for teamwork among Industry, Academic and Research Institutions and Government Agencies to increase the success rate of drug molecule discovery and the motto should be “Collaborate, Innovate and Dominate”. He also appealed to the State and Central Governments to increase the R&D expenditure in this regard.

Dr Sivaramakrishnan in his lecture, underlined the importance of collaboration through invention, by making alliance between Industry and Government Institutions. He briefed the

excellent laboratory facilities available at PLSL for carrying out drug discovery research and listed some of the collaborations, which PLSL holds with various government R&D academic institutions and private agencies in India as well as overseas. He cited the recent example of the collaboration between CECRI and M/s Piramal healthcare Limited, a subsidiary of PLSL, for the development of a novel electrochemical HbA1c meter which is now undergoing screening tests.

He also briefly touched upon the PLSL's R&D efforts targeting the discovery of drug molecules for the treatment of cancer, inflammation and diabetes. He expressed the hope that our nation with her abundant multi-faceted resources would strive to establish a leadership position and be established as “India — Next Knowledge Power” and “India — Future Factories”. He concluded his talk by playing a “Science Anthem”.

Presiding over the function, Dr V. Yegnaraman, Acting Director, CECRI, recalled the events of CSIR Foundation Day in 1942, and mentioned that CSIR today is one of the largest public funding R&D Institutions in the world. He pointed out that CSIR, over the years, had contributed ‘A to Z’ in science starting from Aerospace to Earth Science covering Biological Sciences, Chemical, Engineering Sciences, Ocean Studies, Marine Studies, and Environmental Pollution etc. On this occasion, Dr Yegnaraman, on behalf of the entire CECRI community, paid homage and respect to the philanthropist, Dr R.M. Alagappa Chettiar whose patriotic fervour and noble gesture led to the establishment of CECRI at Karaikudi.

Earlier, Dr N. Palaniswamy, seniormost scientist of CECRI and Chairman, Organizing Committee welcomed the gathering and introduced the Chief Guest.

Dr A. Muthukrishnan, Controller of Administration, CECRI proposed the vote of thanks.

### Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow

On the occasion, an improved variety of lemongrass ‘*CIMAP Suvarna*’ was given to two farmers of Jhansi and Barabanki districts at a special function organized by CIMAP. A new variety of “*Ashwagandha*”, NMITLI-118 developed under the NMITLI Project was released by the Minister for Science and Technology at the CSIR Foundation Day

function organized in Vigyan Bhavan, New Delhi.

Dr Rakesh Tuli, Director, NBRI was the Chief Guest on the occasion. Prof. Ram Rajasekharan, Director CIMAP, while welcoming the distinguished gathering presented the brief report on the progress of the Institute. Dr U.C. Lavania introduced Dr Tuli to the audience.

Dr Tuli, in his speech, praised

the effort of CIMAP in not only developing the technologies and improved plant varieties but also in making them available to the farmers and entrepreneurs. He said that under the NMITLI Project the new variety of “*Ashwagandha*”, NMITLI 118, will be followed by some other designer plant varieties useful for various common health problems like stress, etc.



Dr. R. Tuli, Director, NBRI delivering the CSIR Foundation Day lecture



Release of Farm Bulletins



Welcome Address by Prof. Ram Rajasekharan, Director, CIMAP



Release of Annual Report, 2009

On this occasion, some publications of the Institute which include *CIMAP Annual Report 2009*, *Journal of Medicinal and Aromatic Plants (JMAPS)* and popular magazine 'Aus Boond' were also released.

Later, in the afternoon, a joint celebration of CSIR Foundation Day was organized in the Scientific Convention Centre in which Dr Nitya Anand, Former Director, CDRI delivered the Foundation Day Lecture. Dr T. Ramasami, Secretary to the Government of India, Department of Science and Technology presided over the function. The function was attended by eminent scientists of the city besides staff members and students from CDRI, IITR, NBRI and CIMAP.

## Institute of Microbial Technology (IMTECH), Chandigarh



Prof. Sathyamurthy delivering the CSIR Foundation Day lecture

At IMTECH, Prof. N. Sathyamurthy, Director, Indian Institute of Science Education and Research (IISER), Mohali, delivered the Foundation Day Lecture on, *Atoms and Molecules in a Confined Environment*.

Prof. Sathyamurthy expressed that at present, there is a lot of interest in studying the behaviour of atoms and molecules in confined environments. It is known that hydrogen, an insulator, can behave like a metal under extremely high pressure conditions. It is known for long that molecules, which are hydrogen bonded can exhibit a red shift in the O-H stretching frequencies. Prof. Sathyamurthy

informed that if the same molecule is confined to the inner side of a fullerene cage then it can exhibit blue shift in the frequency. These shifts are similar to the Doppler effect in the sound of the whistle that one experiences when a train is going away from you or coming towards you.

He showed how the optical and electronic properties of a fullerene cage can be modified by packing atoms and molecules inside the cage. Known as endohedral fullerenes, such molecular cages have been the focus of attention because of the possibility of enormous technological applications. For example, one can make



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a semiconductor out of an insulator. By doping the fullerene cage by boron and nitrogen atoms, he told that fullerenes of different colours can, in principle, be produced in the laboratory. He also pointed out that water clusters confined under molecular pressure can behave differently. For example, the hydrogen bond between water molecules, which is responsible for all the wonderful properties of water can get broken under high pressure. This could happen, in principle, in the cavities created when fullerene cages are formed or when proteins

fold in a biological system.

Prof. Sathyamurthy in his lecture, emphasized the benefits of collaboration between institutions. He informed how his collaboration with Dr Subramanian and his group in CLRI, led him to publish a large number of papers in scientific journals and many of them appeared in the list of top 10 most accessed articles. His collaboration with a DRDO lab led him to explore the exciting possibilities of fine-tuning properties of materials.

Earlier, Dr Girish Sahni,

Director IMTECH, welcomed the guests. He mentioned that CSIR has already striven to live up to Government's expectations, and its achievements in various spheres is being recognized at the National and International level.

The function was presided over by Prof. K.N. Pathak, former Vice-Chancellor, Panjab University, Chandigarh. Throughout the day, several students and researchers from other Institutions visited the labs of the Institute to know about the research being carried out at this premier National laboratory.

### National Aerospace Laboratories (NAL), Bangalore

NAL celebrated the 67th CSIR Foundation Day on 30 September 2009. Dr A. R. Upadhyya, Director, NAL, welcomed the distinguished gathering and introduced the Chief Guest, Shri Ashok Nayak, Chairman, Hindustan Aeronautics Limited, Bangalore, who delivered the CSIR Foundation Day Lecture on '*Indian Aerospace Industry — An Odyssey.*'

Shri Nayak, in his lecture, traced the road map of the evolution and growth of Indian Aerospace Industry. Hindustan Aircraft Limited was conceptualized in 1939 by the pioneering industrialist Late Seth Walchand Hirachand. Shri Nayak's reflections of the achievements of Indian Aerospace Industry were introspection to many at NAL, as the collaboration between NAL and HAL was almost five decades old. Initially HAL collaborated with the InterContinental Company, USA,

for the manufacture of Harlow trainer and fox fighter, and later took up the repair and overall belonging to allied forces during the Second World War. After its takeover by the Government of India, the mission of HAL was self reliance, design, development and production of aircrafts to serve the country's growing needs. Production of *HT-2*, a two-seater by HAL used by IAF, put India on the aerospace map. This was followed by *Pushpak*, *Krishak*, *Pasand*, an agricultural aircraft, the fighter aircrafts such as *Marut*, *Ajit* and trainer aircrafts such as *Kiran Mark I and II*.

Shri Nayak categorically stated that a country's military strategy should be seamlessly intertwined with both research organizations and industry. The launch of the Light Combat Aircraft in 1980 boosted the military aviation industry under the aegis of ADA. The fighter aircraft and helicopter

*MIG-21* and *SUKHOI* series have been produced under license from foreign companies. Despite denial of critical technologies and support, Indian aviation industry has been able to extend the vital support through indigenous efforts and the old generation aircrafts such as *AVRO*, *DART* and *KIRAN* continue to fly through mid-life upgradation and long time support. "It is sad that we still look upon the western world for advanced technologies such as sensors, actuators and radars", Shri Nayak said. With his wisdom of many years, he further cautioned that no country can remain strong with borrowed capabilities and India with its immense strength in material and human resources should be now self sufficient.

Thrust in the defense fields – militarization of space advanced communication networking systems, anti-ballistic missiles, electronic intelligence systems etc., was

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essential. Shri Nayak urged DRDO labs, NAL and HAL to enter these areas and complimented NAL on its composite, carbon fibre and structural expertise. HAL is looking forward to use the carbon fibres in ALH. The LCA has truly been a state-of-the-art aircraft with significant contributions from institutions such as NAL, HAL, ADA and DRDO to develop it. HAL has new joint ventures with companies in the areas of multi-functional display, engine components, simulation, miniaturizing of electronics and software to name a few. The nation is looking forward to see SARAS rolling out of its Hangars, (for which HAL is the production partner). HAL –NAL were a true example of a lab and industry synergy, using the resources optimally for mutual

growth of aviation capabilities. Private industries should not be looked upon as competitors. On the contrary, more players would help set up a robust aviation industry. The Government's investment initiative has attracted TATA, L&T, Mahindra and Godrej into the aviation industry. It is envisaged that these major players would develop their centers of excellence in niche areas and lead to a healthy growth of the aviation industry. Shri Nayak concluded that the aviation sector in India is poised for a quantum leap to meet the dynamic and emerging aviation needs.

Dr Satish Chandra, Scientist, Structural Technologies Division, NAL, delivered the 12<sup>th</sup> NAL Business Lecture on, *RTA as a Business Proposition*. From the past two years, the RTA team led by

Dr Kota Harinarayan has been working on this concept, deliberating and working out the best strategies in the areas of marketability, feasibility, operations and technical perspective. The civil aircraft is extremely complex and is set to take off in an even more complex Indian environment. Each stakeholder looks at RTA as a business proposition, while for the Government, it is an economic proposition. Unfortunately, of the total 450 airfields which are LTA compatible (3000-5000 ft) only 66 are being utilized. A detailed analysis of the route network and sector wise load has revealed that ATR-72 operates on smaller routes while the regional jets operate on longer routes. The global market for the regional transport aircraft is expected to be more than 7000





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during 2013-2027. The best way forward would be to have 30% decrease in fuel, 25% decrease in ownership costs, speed higher than ATR, maintenance cost and above all, the ability to use airfields with minimum ground facilities.

Dr Chandra told that NAL has initiated research in the areas of aircraft design, health monitoring to bring down the maintenance cost

(both prognostic and diagnostic), coatings to increase the laminar flow, complete composites, active and vibration noise control, GPS for comfortable aircraft and fly-by systems. Collaboration with other R&D institutions in flow dynamics studies, digital fly-by wire and scouting of new materials like CRR with regard to crashworthiness is ongoing. On an end note, Dr

Chandra suggested that the best business model would be the Public-Private model and foreign collaborations would leverage certification.

Awards were presented to the children of employees of NAL, who had excelled in academics and sports during the year 2008-09. Dr M. R. Nayak, Adviser, M&A, proposed a vote of thanks.

### National Geophysical Research Institute (NGRI), Hyderabad

At NGRI, Padmashri Prof. P. Balam, Director, Indian Institute of Science, was the Chief Guest and he delivered the Foundation Day lecture. Prof. Balam, in his talk described the various analytical techniques that revolutionized Modern Biology and Medical Sciences. His lecture focused on the 'Applications of Mass

Spectrometry in Biology' starting from the classical experimentation by Stanley Miller and J. J. Thomson and a chain of subsequent developments which enabled current advancements in analytical chemistry applicable to biological materials. Specific applications the identification of disease causing mutations in proteins and analysis of complex peptide

libraries in natural venoms and other materials were also highlighted.

The lecture was preceded by a presentation by Dr V. P. Dimri, Director, NGRI, on the recent achievements of the Institute. Dr Y. J. Bhaskara Rao, Scientist G, in NGRI, proposed the vote of thanks.

### National Physical Laboratory, (NPL), New Delhi

At NPL, the Foundation Day Lecture was delivered by Dr Anil Kumar Maini, Director, Laser Science & Technology Centre (LASTEC) on, 'Battlefield Lasers and Optoelectronics'.

A significant event of Foundation Day function was observing Open Day when a special thought was given on how advanced research work could be imparted in simple and easy way to the students without research background. During the 'Open Day', observed on 6 October 2009, a total of 2164 visitors were shown 34 exhibits through seven routes. Students from 32 Schools and 11 Colleges along with their

teachers, as well as some general public visited NPL. School children from reputed public schools, Kendriya Vidyalayas, Government schools, visited the scientific displays. Students from Bareilly, Hisar, Sonapat, and Faridabad also participated in the Open Day Programme.

Some of the activities on display were Superconductivity, Solar Cells, Organic Light Emitting Diodes (OLED), Electro Chromic Devices, Carbon Composites, Carbon Nanotubes, Light-Weight-Alloys for aviation industries, National standards activities like AC high voltage, force and pressure

standards LIDAR, IONOSONDE, Conducting polymer, Biosensors, Scanning Electron Microscopy, TEM, CMM machine, Glass Technology Unit, Liquid Helium Plant, Nanometrology, Magnetic materials and standards, etc.

The CSIR Foundation Day Celebration was observed in NPL this year in a very vibrant and enthusiastic atmosphere. The other components associated with this occasion were cultural programmes, drawing and painting, essay, music and quiz competition. On this day staff members who won awards were also honoured.

## Workshop on ‘Open Access Publishing’ at NISCAIR

The National Institute of Science Communication & Information Resources (NISCAIR), New Delhi, organized a two-day Workshop on ‘Open Access Publishing’ on 22 and 23 October 2009 to celebrate the 1st International Open Access Week observed from 19-23 October 2009.

The Workshop was organized to carry forward the benefits of open access to scientific community, more so to enhance the visibility of research performed in India. This Workshop was aimed at imparting training in Open Access Journal Publishing. The Workshop was based on OJS, an open source publishing software. S&T staff from five CSIR Laboratories — NEERI-Nagpur, CDRI-Lucknow, CIMAP-Lucknow, CFTRI-Mysore and SERC-Chennai, participated in the Workshop. These laboratories publish peer-reviewed research journals. The faculty for the Workshop consisted of Shri Sukhdev Singh, Technical Director, National Informatics Centre and



Seated on dais (from left) are: Shri S. B. Burde, Dr B.C. Kashyap, Dr P. Banerjee, Dr K.Y. Kavathekar

Shri S. B. Burde, Scientist, NISCAIR. All stages of editorial processing from online submission of manuscripts by the author, review process, accepting article for publishing and to its final hosting for open access were covered in the Workshop. This Workshop gave ample expertise to the participants to implement the Open Access Publishing System for their journal publishing.

Earlier, Dr B.C. Kashyap, the then Acting Director, NISCAIR, in

his Welcome Address, highlighted the need for Open Access Journal Publishing for globalizing S&T knowledge and scholarship. He informed that 17 peer-reviewed journals in frontier areas of research in S&T published by NISCAIR, are included in important Abstracting and Indexing databases, and have a good global impact. Since last year NISCAIR has set up an Institutional Repository (<http://nopr.niscair.res.in>) in which all the 17 research journals are available



**Left:** A group photo of the participants of the Workshop. **Right:** Shri S. B. Burde delivering his lecture



in open access mode. The repository at present has about 5400 articles. Current issues of all the research journals are being uploaded in NOPR for open access, well before the publication of print version.

Dr P. Banerjee, Director, NISTADS, in his Inaugural Address emphasized the importance and need of Open Access for the benefit of global research community. He appreciated the lead taken by NISCAIR in this area by hosting all 17 research journals in Open Access and for imparting necessary skills for others in this area.

During the concluding session, NISCAIR assured all the participants to offer full technical support in establishing Open Access Publishing System at their end. Participants also showed keen interest in starting the online publishing activities in their laboratories.

## Dr R.K. Chadha elected Fellow of National Academy of Sciences

**D**r R.K. Chadha, Scientist, National Geophysical Research Institute (NGRI), Hyderabad, has been elected as the Fellow of the prestigious National Academy of Sciences in 2009, for his outstanding contributions to earthquake and tsunami research in the country. Dr Chadha is also the President of the International Natural Hazard Society as well as the Secretary-General of the Asian Seismological Commission. At NGRI, he is the Head of the Seismology Group. In addition, he is also a member of several expert committees of the Department of Science and Technology, National Disaster Management Authority and the Ministry of Earth Sciences, Government of India.



Dr Chadha's initiatives in Broadband Seismology, Post Latur earthquake in 1993 have provided high fidelity data from networks to understand the Indian shield seismicity and structure and have broken new ground in constraining the Lithospheric-Asthenospheric Boundary (LAB) below the Indian Plate. This has resulted in providing a convincing explanation to a global geodynamical problem of the rapid drift of the Indian tectonic plate vis-à-vis the Australian and African plates during Cretaceous times.

His other notable contributions are numerical modeling of pore pressure changes and stress transfer in crust owing to reservoir loading to cause triggered earthquakes, the concept of nucleation of foreshocks towards the source of an impending moderate size earthquake and related water level changes in deep wells as precursors and providing first estimates of tsunami run-ups heights to develop thousand of scenarios for inundation of Indian coastal areas for different earthquake sources along the Andaman and Nicobar islands and Sunda trench.

His work on paleoseismology during 1990s helped in estimating the recurrence period of great earthquakes in Assam region and initiated several similar studies in the country. Dr Chadha led a National Initiative to lower the detection threshold of earthquakes in the Indian shield to <M3.5.

Earlier, he had been the recipient of the National Mineral Award in Geophysics, the Decennial Award of the Indian Geophysical Union and was honoured with a Fellowship of the Andhra Pradesh Academy of Sciences in 2008.

He has made several research contributions that include 60 papers in national and international journals, 37 technical reports and one US patent.

Printed and Published by Deeksha Bist on behalf of National Institute of Science Communication And Information Resources (NISCAIR), (CSIR), Dr K.S. Krishnan Marg, New Delhi -110 012 and printed at NISCAIR Press, Dr K.S. Krishnan Marg, New Delhi -110 012

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**Design:** Neeru Sharma and Sarla Dutta; **Production:** Kaushal Kishore;

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