



SAMPARK TAA newsletter



IN THIS ISSUE

- ⇒ Editor's Message
- ⇒ From the Patron's Desk
- ⇒ TAA President's Message
- ⇒ Public Lectures
- ⇒ Interviews
- ⇒ TAA Red.Com Portal
- ⇒ Awards and Honors
- ⇒ Contributory Articles
- ⇒ TIFR Alumni News



Editor's Message



A regular publication of TAA Newsletter, SAMPARK, which was started in 2001, significantly enabled TAA members to remain connected. The print edition of the Newsletter was generously supported by donors starting with late Prof. Karamjit Arya to SASKEN, TCS and TIFR till 2007. In 2008, we switched to the online edition only. The online avatar included important TAA events such as Public Lectures by distinguished alumni, and also their life and work at TIFR. One new TAA feature is the creation of TAA-Red.Com Portal linked to TIFR site www.tifr.res.in/~alumni. We think this portal will go a long way in keeping alumni connected and also will help them in creating their own home-page at a very nominal fee.

We are making efforts to increase the members. One new approach we adopted is by enrolling student members as associate members as soon as they register for their M.Sc./Ph.D. Hence, TIFR deemed University will play an important role in enhancing the future alumni. We also hope, the Newsletter would make a significant contribution in helping members to stay connected.

Based on the decision of TAA Executive Committee, the new editorial team has taken over the activities related to Newsletter from December 2013. We wish to place on record and thank the past editorial team of Prof. K.P. Singh and Dr. Aravind Chinchure for their wonderful work on the Newsletter for the past many years.

Enjoy Reading!



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Acknowledgement

We thank
Mr. Nilesh Kulkarni and
Ms. Margaret D'Souza
for their efforts in designing this newsletter.

From the Patron's Desk



I am delighted to note that TAA has been active in many activities, notably organization of Public Lectures in a sustained way over the years. One important initiative is the recognition of distinguished alumni through TAA Excellence awards. This initiative started in the Homi Bhabha Birth Centenary year, should be encouraged to continue in the future.

I also appreciate the initiative by TAA in the implementation Ramakrishna Cowsik and Saraswati Cowsik Awards founded by Prof. Ramanath Cowsik. This award, started in 2013, will become an annual feature.

I hope the Newsletter would go a long way in providing link between alumni and also between alumni and the Institute. I look forward to the issues to follow in keen anticipation.

Mustansir Barma
Director, TIFR and patron of TAA

TAA President's Message



Greetings and best wishes to you all.

At the outset, I wish to thank the editorial team K.P. Singh and Aravind Chinchure for their dedicated work in bringing the TAA Newsletter 'Sampark' back last year. Hope the 2012 edition of Newsletter was interesting and useful to alumni. They have brought out some new features.

Based on the decision of TAA Executive Committee, a new editorial team of Ramesh Chaughule and Sangita Bose has taken over the 2013 edition. I take this opportunity to thank them for bringing out the 2013 edition. This edition has many contributors with some new features such as 'Public Lectures' and 'Contributory Articles'.

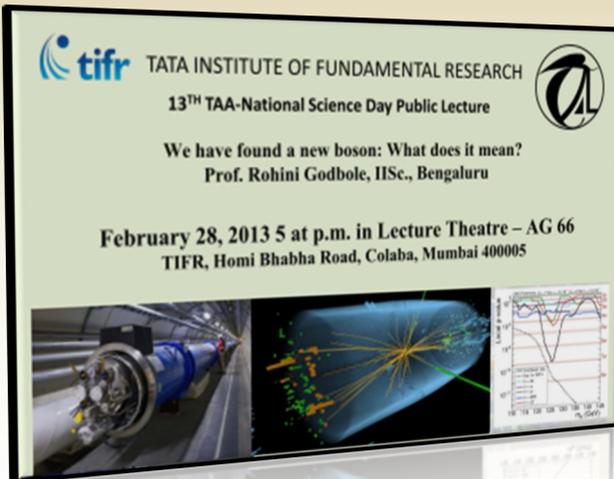
During this year, TAA has taken two major initiatives. The first is the introduction of Associate Membership for students registered for their M.Sc./Ph.D. The last AGM amended the constitution to enable students to enroll as Associate Members as soon as they register for M.Sc./Ph.D. The TIFR Deemed University cell has taken active interest in enrolling students as Associate Members of TAA. The second initiative is the creation of TAA-Red.Com Portal. The IT company Red.Com was kind enough to give this service free of cost to TAA. The TAA website is linked to <http://www.tifr.res.in>.

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TAA Public Lectures

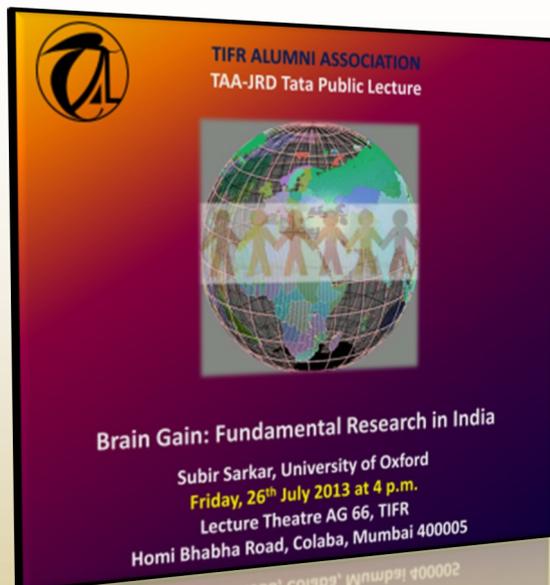


TAA organized two public lectures in 2013. One was held on the National Science day, 28th February by Prof. Rohini Godbole (IISC, Bangalore). The other was the TIFR–JRD Tata Public lecture on 26th July by Prof. Subir Sarkar (University of Oxford, UK).



TAA -National Science Day Public Lecture on February 28, 2013 by Dr. Rohini Godbole, Centre for High Energy Physics, Indian Institute of Science, Bengaluru.

We have found 'a' new boson: What does it mean?



The JRD Tata Public Lecture on Friday, July 26, 2013 by Professor Subir Sarkar a TIFR Alumnus and currently Head, Particle Theory Group, Rudolf Peierls Centre for Theoretical Physics, University of Oxford.

Brain gain: A personal view of fundamental research in India

Interviews



“In addition to having the depth of understanding in your niche, one should also have a holistic overview of many areas of science, even if they are not connected to your area of research.”

Professor Rohini Godbole

“The only advice I would give youngsters is to be bold and not afraid of challenging received knowledge. Almost by definition it is likely to be wrong and/or incomplete.”

Professor Subir Sarkar



“Focus on delivery of a result, a product, a report or a process that can be verified by experts.”

Dr M V Pitke

“It is a great opportunity to be in TIFR. Make the best of it. Leave your imprint. Never hesitate to explore new careers.”

Dr Ranganathan Navalgund



Interviews



Interview of Prof Rohini Godbole conducted by Prof Amol Dighe



“In addition to having the depth of understanding in your niche, one should also have a holistic overview of many areas of science, even if they are not connected to your area of research.”

Professor Rohini Godbole

Rohini Godbole is a Professor of Physics at the Centre for High Energy Physics in the Indian Institute of Science, Bangalore. She was a postdoctoral Visiting Fellow in the Department of Theoretical Physics during 1980-82, and even later when at the Mumbai University and IISc Bangalore, has continued to have close ties with TIFR. She is the author of two books: “Theory and phenomenology of Sparticles” on the search for supersymmetric particles, and “Lilavati's daughters”, which contains biographies of Indian women scientists. Prof. Godbole shares her life experiences and ideas with Prof. Amol Dighe (TIFR).

AD : Can you tell us about your childhood, early education, and what got you interested in science?

RG : I grew up in a middle-class family in Pune, and studied at the Huzurpaga school, which was considered one of the best girls' school in the city at that time. However it only taught Home Science. So my first encounter with formal science was while studying for the State Scholarship exam in the seventh standard. It was then that I discovered that I liked mathematics and science, and continued to study it on my own, with the help of some teachers outside school.



Prof. R. Godbole giving her public lecture at TIFR

Interviews



Interview of Dr. Rohini Godbole continued...

At home and in the close family there was no scientist – though there were doctors and engineers – so the choice of science as a career happened rather late. In some sense the symmetry between Science and Sanskrit was broken when I got the National Science Talent Search scholarship, which also enabled me to work in IIT Delhi, IIT Kanpur and Bangalore University during summer vacations, while I was doing my B.Sc. from the S. P. College in Pune. It was during this stage that I actually saw scientific research at close quarters and decided to make it my career. A lot of credit is due to some of my teachers at IIT Bombay during my M.Sc days – I would specially like to mention Prof. S. H. Patil -- when I took my first steps in basic research.

AD : Your Ph.D was from the State University of New York, Stony Brook. Tell us about how that came to pass, and how that experience was.

RG : It happened without much planning, as a result of some help, push, and encouragement from fellow students in IIT Bombay, combined with the possibility of a scholarship from the American Association of Women Scientists. I spent five years at Stony Brook, received my M.S. and Ph.D there. Exposure to international research at such an early state of my career expanded my horizons, and it also brought some professionalism in my way of doing research. The experience of living in an alien atmosphere (at that time) with fellow students from all over the world also taught me a lot about life. The diversity I experienced made me realize some of my own prejudices. But of course most importantly, the training I received at the university made me an independent physicist.

AD : And then you decided to come to TIFR...

RG : I wanted to return to India, however the number of places in India which had good high energy groups, and among them those that offered postdoctoral positions, was very limited. I had postdoc offer in the US and one in Europe. But once I received

Interviews



Interview of Dr. Rohini Godbole continued...

a postdoc offer from TIFR, it was clear to me that I should accept that. Even my Ph.D supervisor advised me to go to TIFR, and I remember a Mathematics professor in Stony Brook saying “You are going to the Princeton of the East”, which made me feel rather proud.

AD : Tell us about the life of a postdoctoral fellow in Theory Group then.

RG : The Theory Group, consisted of Virendra Singh the Chair, the three Roys, KVL Sharma, Divakaran, Panditji, Veranda Gupta, Mustansir Barma, S.S. Jha, Partha and may be some more that I forget now. I think Deepak Dhar was a Visiting Fellow then but soon became a permanent member. I ended up collaborating with quite a few of the members in particle physics – Probir, DP and KVL Sharma. I think Deepak and I collaborated on a small popular science article! My three years in TIFR were scientifically quite productive.

There was no postdoctoral culture as such, and sometimes postdocs were just treated as students. The only other postdoc in particle physics was Amitava Raychaudhuri. However there were quite a few senior graduate students, and the physics discussions with them ensured that I did not miss the study circles. We had late night discussions over Night Tea. There was a single computer room with six terminals, where postdocs from other groups would also meet at night. This created a lot of camaraderie among postdocs from all groups.

The Free Meson seminar on Thursdays (this was a pun on the Freemasons) played a large role in shaping my understanding of physics during those days. And so did the Friday Colloquium of the Theory group. The discussions during these seminars were indeed very instructive.

Interviews



Interview of Dr. Rohini Godbole continued...

AD : What about non-physics activities?

RG : I learnt a lot about films during this period – thanks to the “Images” film club. Of course these films were of a certain type, but I think that they contributed to my cultural development. The Amateur Music Association (AMA) also used to organize events to look forward to. Then there were days when we went together for concerts in NCPA, plays in Prithvi Theatre or for hikes near Karjat and so on. All these made for a wholesome experience.

AD : How did the three years in TIFR change you?

RG : It may be difficult to imagine now, but I was a rather meek person then as far as putting forth my views on particle physics was concerned. I would just feel a bit diffident while stating my scientific opinions strongly. That went away during the TIFR years, again thanks mainly to the exposure to Free Meson seminars, and discussions with fellow students and postdocs at nights.

AD : Your TIFR connections continued even when you left and went to Mumbai University ?

RG : Yes. Even when I had to teach at the University, I would make it a point to visit TIFR at least twice a week—for the Free Meson seminar and for the Theory Colloquium. This meant a lot of travel, but this helped me keep up the pace of my research even when I was out of TIFR. I was also involved in organizing many meetings in TIFR – like the DAE Symposium. And we started the Workshop in High Energy Phenomenology (WHEPP) together. I recall that during the DAE Symposium in TIFR, the Convener gave the Vote of Thanks. A colleague of his reminded him that he has not thanked me (for getting the infrastructural support from the University), and he said “but she is ours, we don't need to thank her.”

Interviews



Interview of Dr. Rohini Godbole continued...

AD : What would you like to tell young scientists?

RG : In addition to having the depth of understanding in your niche, one should also have a holistic overview of other areas of science. A judicious combination of productivity and scholarship is needed. Journal clubs and cross-institute collaborations exist, but they should be cultivated.

I have always felt that, apart from some efforts like the SERC schools that are relevant for the graduate students, we are not contributing enough to higher education of science. I mean for the college students, or even at the high school level. We have this hands-off attitude: interested students will come. But the interest in basic science also has to be developed. Making students – and their parents – aware of the interesting and rewarding possibilities in doing science is very important. Some of us contribute to such outreach efforts, but to a very small extent compared to the possibilities.

AD : You have been involved in studying and encouraging the role of women in science. What do you think should be done to get more women in science?

RG : When I came to TIFR, I found myself the only woman in the theory group. I remember, when I would protest people saying 'come on guys let us go for tea/lunch etc', Avinash Dhar used to say 'you are a generalized guy'! Even in the other groups, the number of women was very small. However TIFR is a very small place, so one cannot jump to conclusions with small numbers.

Actually in India, you will find some interesting statistics. The fraction of women at the bachelors level and at the Ph.D level is not very different and so has been the case for the last 20-30 years. However somehow that does not seem to reflect in the number of faculty positions occupied by women. The reasons for these are many, but there have not been many efforts to study them scientifically.

I think change in attitude is the only thing that will help to get more women in science. The attitude problem is of course societal, but at that scale it is too large for

Interviews



Interview of Dr. Rohini Godbole continued...

us to handle. At the level of scientific institutions, we can perhaps handle it to some extent. For example, it is very common for a woman to take a break for child-rearing. Now such a person, when she applies for a postdoctoral position, should not be compared with other candidates with the same number of post-Ph.D years. Such small changes would be a good start. The availability of a good crèche on campus – like TIFR has – would go a long way.

AD : As a girl / woman, have you personally faced some problems during your journey?

RG : I have perhaps been especially lucky, since at my home there was no difference made between girls and boys, all of us four sisters were encouraged to study. Even when I had to go abroad for my Ph.D, my parents did not make me feel that it was some big deal for a girl to go abroad –During my research career also, I have never felt any different. I have faced some amusing incidents, though. After being introduced to a German particle physicist, after hearing my name, immediately told me that he has read papers by my husband Dr. Godbole. People have “appreciated” my work by commenting “Oh, I never know you were a woman”.

AD : How do you think TIFR can get a leverage from its distinguished alumni, like IITs or IISc does, for example?

RG : I think it is unfair to compare TIFR with IITs or IISc in this respect. The small size of TIFR, which is one of its strengths, is also its weakness. The alumni strength is small. Moreover, the number of alumni who have left science is small, so one cannot

Interviews



Interview of Dr. Rohini Godbole continued...

expect someone to come and make large donations to TIFR, as has happened for IITs or IISc. But the intellectual capital of those alumni is always at the disposal of TIFR. When called upon to give specialized lectures or courses or organizing conferences or developing collaborations, the alumni will be very happy to contribute. I am sure that is already happening.

Rohini Godbole

Interviews



Interview of Prof. Subir Sarkar conducted by Prof. K P Singh



“The only advice I would give youngsters is to be bold and not afraid of challenging received knowledge. Almost by definition it is likely to be wrong and/or incomplete.”

Professor Subir Sarkar

Prof. Subir Sarkar is Head of the Particle Theory Group at the Rudolf Peierls Centre for Theoretical Physics, University of Oxford, where he has been on the academic staff since 1990 and was made Professor in 2006. He joined TIFR as a graduate student in 1974 obtaining his PhD in the Cosmic Rays Group. He was a staff member during 1979-84 and Adjunct Professor during 2006-09. He talks about his life and views at TIFR with Prof. K. P. Singh (TIFR).

KP : Details of your journey so far including your childhood, early education, research etc.?

SS : My father had a transferable Government job so my education was in Central Schools (Kendriya Vidyalaya). I was always interested in science and was fortunate enough to be awarded a National Science Talent Scholarship when I finished school in 1969, so went to IIT Kharagpur. Initially I was rather fond of chemistry but physics made me feel more ignorant so I gradually gravitated to it! Those were interesting times - my undergraduate years were marked by the Naxalite uprising in Bengal, the war with Pakistan over Bangladesh, widespread labour unrest, railway strikes etc, etc. Of course the



Prof. S. Sarkar giving his public lecture at TIFR

Interviews



Interview of Dr. Subir Sarkar continued...

whole world was in ferment then with the war in Vietnam, the threat of nuclear annihilation, the emerging environmental awareness movement, student protests everywhere. So I cannot say I learnt very much physics at university but I certainly learnt a bit about life! I graduated with an indifferent BSc degree in 1972 but stayed on at IIT Kharagpur to obtain a better MSc degree. Unlike the rest of my MSc batch mates, I decided that I wanted to stay in India for a doctorate, rather than go to an university in the USA. I was lucky enough (notwithstanding a national rail strike) to make it to TIFR in the summer of 1974 and to be accepted as a PhD student in the Cosmic Rays Group. It is hard to describe just what a thrill it was! It was also pleasing to meet again a friend R. G. Pillay (my BSc classmate from Kharagpur who had gone to IIT Kanpur to do an MSc) who joined at the same time. Another friend at TIFR was the mathematician N. Mohan Kumar who too I knew from IIT Kharagpur. And of course I made many new friends - it was a cosmopolitan place then as it is now - with people from all over India as well as some visitors from abroad.

So I started my research career with Professor Sukumar Biswas studying low energy cosmic rays with nuclear track detectors flown on balloons and satellites, an experiment which I helped to design "Anuradha", was later deployed on the Spacelab-III shuttle mission. However it takes a long time for space experiments to come to fruition, so for my thesis I turned to theoretical problems in high energy astrophysics, in particular cosmic ray acceleration in young supernova remnants and the non-thermal radiation which provide probes of such environments. I was fortunate to have the stimulating guidance of Professor Ramanath Cowsik who really broadened my research horizons, even though I had to write the thesis essentially on my own as he went abroad for some time. It was a formative experience even if it was "trial by fire" - on the whole I think it was good not to have been spoon-fed as it prepared me well for working independently. I suspect I have inherited a bit of Ramanath's style (although he is a hard act to follow!).

Interviews



Interview of Dr. Subir Sarkar continued...

In retrospect I wonder why I was not fired up by the rapid developments in Particle Physics which were happening around then! For example, the “November revolution” (discovery of the J/psi charmonium state) had occurred just as I became a graduate student even if its significance may not have been evident to many of our teachers then, far less to us students! It took me several years of self-study to catch up with these developments and become a particle phenomenologist.

KP : What and who inspired you to reach to the current position?

SS : The next decade marked of course the rise ... and rises of gauge theories of the fundamental interactions and the establishment of the so-called Standard Model (SM). But it had become evident already by the early '80s that although fantastically successful in the laboratory, the SM did not have any explanations for the most basic features of the universe we live in – why it is so big and old, why there is only (baryonic) matter but no antimatter, why most of the (dark) matter is in fact non-baryonic, what is the origin of the primordial density fluctuations responsible for seeding the growth of galaxies and large-scale structures, et cetera? On a visit to Oxford I was fortunate enough to meet the legendary Professor Dennis Sciama who had mentored and inspired several generations of cosmologists (including Stephen Hawking and Roger Penrose) and helped to make it a physical subject. Dennis gave me the best professional advice I have ever had from anyone – on learning of my research background he said he could envisage a new field developing at the interface between Astrophysics and Particle Physics and that I ought to focus on it. This was good timing in 1983. I went to CERN where leading theorists such as John Ellis had become interested in these problems so I worked with him and others. This field developed rapidly into what is now called ‘Astroparticle Physics’. This was a very exciting time at CERN when W and Z were being discovered and new physics beyond the Standard Model seemed around the corner!

Interviews



Interview of Dr. Subir Sarkar continued...

I even worked on a neutrino 'beam dump' experiment with Big European Bubble Chamber searching for evidence of such physics, e.g. sterile neutrinos and super symmetry (my introduction to experimental high energy physics was via my wife Amanda (Cooper-Sarkar). We had in fact first met at TIFR where she had come as a British Council Scholar after doing her PhD at Oxford (perhaps the first foreign postdoc to come there).

KP : What challenges did you face and how did you overcome those challenges during your journey so far?

SS : It was of course a major challenge to switch from Astrophysics to Particle Physics. As mentioned earlier I had to learn field theory more-or-less on my own. I would say that even 30 years later this still constitutes a major "culture gap" between the two communities when it comes to working at the interface namely, in particle astrophysics & cosmology. Whereas the working methods and even sociology of collaboration is becoming similar for astronomers as in high energy physics, there is still an intellectual gulf that needs to be tackled. In simple words, astronomers do not always appreciate that there is a rigid mathematically precise structure underlying e.g. the 'Standard Model' of Particle Physics unlike e.g. the 'standard model' of cosmology which is much more empirical and whose foundations have never been rigorously tested. Conversely, particle physicists do not always appreciate the difficulties in extracting numbers from astronomical observations which are usually convolutions of various unknowns each with their own systematic uncertainties. So it is sometimes frustrating to work at this interface, but it is also of course enormously stimulating and challenging. I am not sure I have fully overcome the challenges. I still do not always feel fully competent concerning what I am working on and wish I had more background knowledge but perhaps that is more common than people usually admit!

Interviews



Interview of Dr. Subir Sarkar continued...

KP : Learning's and insights from your overall experience that will be useful to TIFR community and particularly to the youngsters

SS : In subsequent years I have worked on theoretical aspects of baryogenesis, dark matter, cosmological phase transitions, inflation and large-scale structure formation, the cosmology of neutrinos and other relic particles, astrophysical probes of fundamental laws like Lorentz invariance etc. I also became involved in three astroparticle experiments - the Pierre Auger Observatory in Argentina, Ice Cube at the South Pole and the proposed Cherenkov telescope Array – which are looking for very high energy cosmic rays, neutrinos and gamma-rays respectively. This is an interdisciplinary field for which a standard education in either astrophysics or in particle physics is inadequate. It is essential to have additional training that encompasses the wide range of relevant theory, phenomenology and experiment.

Remembering my own teachers who were generous enough to guide us to interesting problems and provide us opportunities to work on them, I have been involved for many years in research and training networks (e.g. I was coordinator of the Marie Curie network 'Universe Net' which involved 39 institutes in 11 countries, and I also founded a network in Theoretical Physical Sciences between Oxford and leading Indian research centres).

The only advice I would give youngsters is to be bold and not afraid of challenging received knowledge. Almost by definition it is likely to be wrong and/or incomplete. However at the same time, you cannot challenge a historical body of work built up through the contributions of many people without first undergoing rigorous training and becoming expert in the subject. So work hard but do not conform. Otherwise we will not make progress in our understanding of the physical universe and even though it is fantastic that we actually get paid to do this, one must not start thinking of it as a regular job and get into that particular mindset!

Interviews



Interview of Dr. Subir Sarkar continued...

As Dennis Sciama has said: "None of us can understand why there is a Universe at all. Why anything should exist; that's the ultimate question. But while we cannot answer this question, we can at least make progress with the next simpler one, of what the Universe as a whole is like." I like this pragmatic approach and as far as I am concerned, the journey is the reward.

KP : Your experience of getting into TIFR

SS : It was all such a long time (40 years) ago. I vaguely recall a written examination and an interview. The real challenge was physically getting to TIFR given that George Fernandez had called a national rail strike that summer! I think I managed to get a train from Kharagpur as far as Nasik and then had to come by S.T. bus the rest of the way and then find my way in the big city. Somehow when one is young all these things work out somehow!

I also recollect a story (probably apocryphal!) that at the interview they would ask a tricky question, the answer to which would determine which School (Mathematics, Physics or Biology) you would be assigned to. The question was: "If you are in a Casino and the roulette wheel comes up red 10 times in a row, what would you bet on the 11th time?" If you answer "Well the odds are still $1/2$ and $1/2$ for red and black" then you are clearly a mathematician. If however you say "The wheel is clearly biased, it will come up red again" then you are destined to be a physicist. But if you think "It is about time the wheel comes up black" then you must be a biologist!

Subir Sarkar

Interviews



Interview of Dr M V Pitke conducted by Prof. K P Singh



“Focus on delivery of a result, a product, a report or a process that can be verified by experts.”

Dr M V Pitke

Dr. M.V. Pitke is the Founder Director of the Center for Development of Telematics - CDoT which was set up in 1984. He was in TIFR for more than 35 years and has several contributions to the development of computer electronics and communications technology. He pioneered the development of a switching system for mobile networks (1975-80) that was forerunner to the current ad-hoc networks. He was also an Adjunct Professor at the International Institute of Information Technology (IIIT) Bangalore, a Fellow of the Institute of Electrical and Electronics Engineers, the Indian Academy of Sciences and the Institution of Electronics and Telecommunication Engineers. He talks about his life at TIFR with Prof. K. P. Singh.

KP : Details of your journey so far including your childhood, early education, research.

MVP : I was born in Bijapur then in Bombay Karnataka. My father had a transferrable job in the government which took us to the towns of Karwar, Gadag Hubli and Dharwar. There were excellent schools and the area was full of talented people, political leaders and writers. Joined the Karnatak College in Dharwar for my undergraduate studies. The noted writer VK Gokak was one of the principals during my years in the college. The environment was great filled with enthusiasm and excitement. The teaching staff was full of exceptionally competent and well experienced professors with high qualifications earned abroad in science and humanities. I found them very kind, caring and always ready to help.

Interviews



Interview of Dr. M V Pitke continued...

The laboratories were well equipped with equipment that may be hard to find in colleges elsewhere. My hobbies were appreciated and I was allowed full access to the laboratories and carry out some interesting experiments. I was keenly interested in electronics as a hobby, building amplifiers, radios and even transmitters. The cheap war surplus materials was a good source of components. Wished to join an engineering college after my intermediate examination. The competition was tough and it was difficult to get into a college of my choice. Hence I chose the option of doing a B Sc followed an M Sc with specialization in electronics.

Karnatak College was excellent for BSc. Got a good grounding in basics thanks to the keen interest of Prof D J Davar in my studies. Professor of Chemistry, Prof. K S Nargund (PhD London) was very kind to me. He even promised to give a recommendation to CV Raman for further studies. The college was full of bright students who later became eminent personalities in the country in different fields. It was a great lucky break for me when I received an offer from Prof. R D Godbole of Ruia College Mumbai for admission to the MSc course with specialization in electronics and also work as a part time demonstrator.



Interviews



Interview of Dr. M V Pitke continued...

With an MS from MIT(USA) Professor Godbole was a outstanding teacher and had tried to transform the postgraduate education in the University. The college had acquired some of the latest equipment for laboratory experiments in electronics. He had even obtained point contact transistors that were just getting into manufacture. He persuaded me to join the Training School of the Atomic Energy Department. After completing the course I joined the Tata Institute of Fundamental Research in 1959.

KP : Inspiration for Science.

MVP : Difficult to pinpoint. Got interested in electronics/building radios as a hobby in school days. Used to build radios. JC Bose and Marconi as heroes. Used to read regularly US magazines for the amateurs and hobbyists. Liked experimenting with physics, chemistry, electricity, etc. Built a single tube radio for world reception. The editor of a radio magazine was very impressed and he even published it as an article along with my photograph. This was my first paper published in 1951!



Interviews



Interview of Dr. M V Pitke continued...

KP : Problem Faced.

MVP : My biggest problem was getting through the examinations. Was very poor in memorization. Some what disorganized in writing answers, etc. Mathematics was not my strong point. However I found it easy to pick up a new idea and evaluate possible applications, etc. I generally managed to get through with just enough scores ..may be because of good luck....

The challenges faced were those generally faced by one who wants to convert an idea into a product. Converting a laboratory prototype into a system or a product that will be used by others for a long time.

The experience in building instruments for a complex physics experiment is a great asset that helps in building reliable, rugged and complex equipment. Building of TIFRAC computer was almost complete when I joined TIFR and it served as a good model for building large intricate systems. I admired the tremendous, dedicated personal involvement of Prof R Narasimhan in 'putting all things together' to make TIFRAC a great success. Studying this helped me to build (with D S Kamat and SV Rangaswamy) a unique mass , semi random access data storage system based on a magnetic tape system. (the best medium available at that time in 60s) Prof Dharmatti and Prof Phadke insisted on getting a full demonstration of a working system before a paper could be sent to the Indian Academy of Sciences for publication. The most challenging work was the development of a mobile switching system for military applications. (Prof PVS Rao's guidance and support was very crucial here) Our disadvantage of not having any experience in conventional telecommunications on the one hand and the emergence of digital telephony turned out to be of immense value for the development of the switching system for the Indian network(CDOT). There are several examples of the pioneering efforts of

Interviews



Interview of Dr. M V Pitke continued...

scientists in building systems, experimental set ups that needed unique and ingenious solutions. Many of these efforts have gone largely unnoticed, ignored and unrecognized. There s no other institution in the country that can match this.

KP : Learnings and insights ..

MVP : The rich experience a young researcher gets in is TIFR very remarkable. The freedom and the kind of facilities and support provided are be comparable to those in the best academic establishments in the world. It is this freedom that makes one accountable. Thanks to Prof Homi Bhabha who knew exactly the kind of infrastructure required not only for doing high quality science but also for designing and executing large, complex time bound projects. This culture also promoted generation of leaders who played major role in setting up institutions of national importance and undertaking projects that had great impact on the country.

KP : Experience of getting into TIFR.

MVP : I entered TIFR through the training school. Was lucky to join the computer section which was apart of the instrumentation group headed by Prof. D Y Phadke. The interview (by Babulal Saraf and B K Basu) for entrance to training schools was quite interesting. As far as I remember, could handle well questions related to the experimental physics. In those days every new researcher was provided a tool kit and a lab coat on joining the duty along with an authority to 'spend' within a limit and a free access to the library. This was quite unique considering the kind of restrictions (even now) faced by very senior scientists in other institutes.

Interviews



Interview of Dr. M V Pitke continued...

KP : Life in TIFR and the most memorable impact

MVP : Life in TIFR has generally been a most enjoyable experience. My most enjoyable early experience was the chance meetings with Homi Bhabha who used to bring very prominent visitors to the Computer Centre generally in the mornings. On several occasions he used to introduce me to the visitors. Remember meeting Weinberg, J K Galbraith, P M S Blackett, ... and the most important, Jawaharlal Nehru! On one of the visits he saw a colorful circuit board in my hand, one of the first transistorized decade counter. He liked it very much and requested me to keep it in a display....

I did face some resentment from those who thought the Institute was exclusively for pure research. Was compelled to publish papers to survive the competition. I was quite fortunate to be able to do this successfully.

After Homi Bhabha's sudden passing away marked the beginning of a slow but significant change in Institute's activities. The Institute had good experience in building complex instrumentation needed for physics experiments in a wide range of areas from RF to digital signal processing. The techniques used were on par with the other laboratories in the world. With this background, it was called upon to help in defence preparedness by taking responsibility for development of some critical systems, subsystems and components. This was done quite successfully. It became one of the very few institutions that demonstrated convincingly how to build and deliver large, complex, electronics systems. A large number of experts and leaders created through this effort played important roles in various institutions in the country.

TIFR also helped development and promotion of indigenous technology in several areas. It encouragement of local entrepreneurs in building somewhat advanced

Interviews



Interview of Dr. M V Pitke continued...

electronics components, equipment and instrumentation helped not only its own experimental programmes but also in national development. At that time large private companies were reluctant to step into this field. A noteworthy example is the digital PBX from CDOT which had its origin in TIFR, but later on was successfully expanded, operated and maintained by a modest team in TIFR.

KP : Functioning of TIFR during my stay and later

MVP : During my early years in TIFR Homi Bhabha used to get personally associated with almost every aspect of TIFR. He was very concerned about the welfare of the staff and had several plans to cover the needs of housing, education and transport. He was assisted by a highly competent team. The then registrar N R Puthran knew well Bhabha's mind and tried to put into practice his ideas. He knew how to treat (and help) young researchers some of whom had very unconventional habits. TIFR is one of the very few institutions that never closes, even on Sundays and holidays.

There was a constant flow of top scientist from all over the world and their presence in the Institute and more importantly the ease with which one could talk to them. It was once-in-a-lifetime opportunity for us during the inaugural function of the Institute in January 1962 during the formal inauguration of the building by Jawaharlal Nehru. A large number of very eminent scientists, some of them Nobel laureates, from all over the world visited and delivered a number of lectures. I met Walter Rosenblith who later became the provost of MIT . During my visit to MIT in 1965 introduced me to the top researchers engaged in some pioneering, path breaking ideas of time sharing and picture processing. A visit to the University of Mexico introduced me to some of the top researchers in computer science in the world at a week long seminar organized by Sergio Beltran who had an ambitious plan for setting up computer activity in the University as well as the Industry.

Interviews



Interview of Dr. M V Pitke continued...

One of the great facilities enjoyed by researcher in TIFR is the facility of study leave which enables the young researcher visit a University abroad for PhD in his favorite field or spend one or two years in a leading laboratory. I was immensely benefited from this. I spent a year at the computer laboratory of the University which had a built a medium size computer called CEP built, at the initiative of Enrico Fermi, with the concept of microprogramming for the first time on large scale. This concept was proposed Prof M V Wilkes of Cambridge University. My work was quite interesting and challenging; using tunnel diodes for driving thin film memories. This work lead to some good publications that later formed part my PhD thesis.

There was a thin film group headed by Prof Heinz Billing who invited me to join the group for development of circuits for a unique film memory design that he had invented. This was at the Max Plank Institute of Physics in Munich headed by Werner Heisenberg. It was wonderful to have an appointment signed by Werner Heisenberg himself to work as a Research Associate.

Subsequently I had many other opportunities of working on important project projects. The most important being the setting up of the Centre for Development of Telematics –CDOT with Sam Pitroda and G B Meemamsi. The support of Prof M G K Menon and Prof B V Sreekantan was very crucial here. Taking advantage of the core team that had successful developed of the mobile switching system for the military we were able to develop, build and transfer technology for a family of telecommunications switching system that formed a major portion of the Indian network in the 90s and early 2000. A totally indigenous effort. from cabinet design to circuit design, it led to a revolution in communications in India. This is by far of the most successful indigenous efforts that resulted in production and delivery of more than 60 million telephone lines (at Rs 5000 each).

Interviews



Interview of Dr. M V Pitke continued...

Recognition of this work gave me opportunities of associating myself with eminent scientist and academicians and in particular working closely with Prof. Abdus Salam in his training programs and laboratory projects. Was elected Fellow of the Institute of Electrical and Electronics Engineers.

KP : Advice and Suggestions to the students, faculty, and alumnus of TIFR

MVP : The scientific scenario has changed considerably during the last couple of decades. It appears our performance and delivery was very good when we were working under the most difficult circumstances. Limited fund and very severe import restrictions. Less opportunities of foreign travel. Scientists had to build their own instruments and test equipment. This gave them very valuable experience that helped undertaking major projects. Over the years this seems to have become less common. The focus has shifted to the acquisition of the most sophisticated equipment. Several years ago I came across an advertisement calling for tenders for setting up an advanced plasma physics laboratory! If we have to acquire mastery over the field, we must get back to building our own systems as is being done at CERN in Geneva. I would like to make a special request to our alumni. Many of them have been very successful in their careers and have become prosperous. They should consider to the possibility of a payback, making some (even modest) contribution to the TIFR endowment.

KP : Specific views on science education, research, innovation, management, policy, etc. Views on future research in India.

MVP : Many may not agree with my observation, but as India gets richer and richer, its achievements in science and engineering appear to have become less and less significant. This is probably due to the a disgraceful neglect of the basics. You cannot hope to develop an advanced mobile or satellite communication network

Interviews



Interview of Dr. M V Pitke continued...

with engineers who do not know Fourier analysis or Maxwell's equations. Engineering education has been reduced to memorizing large number of questions and answers. Projects that have to be based on building a prototype are now readily available in the market.

Even PhD dissertations can be purchased at a price. We have a mass of bright graduates who may serve well as raw labour for execution of very advanced and complex projects in the West, but are unable to produce good useful products or technologies for India for large scale applications. We may need to have a two pronged approach. Working with hands. Encourage more practicals work in the laboratory. Focus on delivery of a result, a product, a report or a process that can be verified by experts. Do not give too much importance to the number of publications and their citations.... and most important, recognize and respect work done in India.

Be aware of the challenging problems in India that are waiting for a solution. There are very good peers in India too. Faculty members could be more generous, tolerant and even indulgent towards the young. Respect divergent views. They have to move from the role of researcher to the role of a leader/mentor/facilitator. Strive to set examples to the younger colleagues.

TIFR has been working somewhat in isolation. Need to establish closer working relationship with the Universities in India.

M V Pitke

Interviews



Interview of Dr. Ranganath Navalgund conducted by Prof. K. P. Singh



“It is a great opportunity to be in TIFR. Make the best of it. Leave your imprint. Never hesitate to explore new careers.”

Dr Ranganath Navalgund

Dr. Ranganath R. Navalgund was the director of Space Applications Centre, ISRO between 2008 and 2012 and is well known for his numerous contributions towards the growth and development of the space applications programme of the country. Earlier he was also the Director of the National Remote Sensing Agency (NRSA), Hyderabad and was responsible for establishment of the Decision Support Centre, a unique facility to help disaster-monitoring and mitigation using space borne and airborne systems. He did his PhD from TIFR in 1977 soon after which he joined ISRO. He has been elected President of the Technical Commission of the International Society for Photogrammetry and Remote Sensing (ISPRS) on Resource and Environmental Monitoring (2000-2004), and as the Chair of the Working Group of the International Academy of Astronautics on Disaster Management/Natural Hazards. He shares his life experiences and general views of the country's space program with Prof. K. P. Singh.

KP : Details of your journey so far including your childhood, early education, research.

RRN : I had my early education in the vernacular school located near our house till I passed school leaving examination in 1964 (b. March 17, 1948, Dharwad, Karnataka). I joined the Karnatak Science College and did my B.Sc in Physics with Mathematics as subsidiary (1968). My joining Science stream was purely influenced by the fact my two elder brothers had taken up Engineering and Medicine streams respectively. Subsequent to that I happened to appear for a test for admission to IIT, Bombay and

Interviews



Interview of Dr. Ranganath Navalgund continued...

joined there for M.Sc (Physics) course. There were three possibilities after my M.Sc; joining for research at IISC, Bangalore, Training School of BARC/DAE or Graduate studies (Visiting Membership) at TIFR. I chose TIFR and ended up its alumnus. About research, less said the better.

KP : What and who inspired you to take up science and succeed in your endeavours?

RRN : With modesty, I must say I was a good student in school and used to do well in mathematics. General trend those days was, if you are good in mathematics, you take up science or engineering. Our Chemistry and Physics teachers in the school were very good and made learning exciting. Early sixties were also years of beginning of rockets and satellites in the world. All these together influenced my leaning towards science. Remote sensing activities were just beginning and I had the opportunity to start the field from scratch. System studies to define major specifications of a satellite system Joining Department of Physics IIT, Bombay gave a further fillip to this endeavor. I did a small project on Electron Paramagnetic Resonance during the second year of M.Sc at IIT. Appreciation expressed by Prof Vijayaraghavan of TIFR, who came as the examiner for my defence of the project work strengthened my desire to join for graduate studies/research at TIFR.

KP : What challenges did you face and how did you overcome those challenges during your journey so far?

RRN : Academic journey through school, college and IIT was quite straight forward and without any insurmountable difficulties. Of course initial days at IIT did bring a bit of anxiety. The first challenge faced after joining TIFR was not a scientific one; it was to find a place to stay in Bombay. There was no hostel worth its name at TIFR. The rat-infested 'Old Yacht Club hostel' was already overcrowded with no place for newcomers. Some of us managed a place in the University hostel. Graduate courses

Interviews



Interview of Dr. Ranganath Navalgund continued...

were not taught like in a conventional teaching institution. We had to do more home work. There was also peer pressure, since classmates were the brightest students from across the country.

Choosing a research area and the guide depended not only on our aptitude but also on how well we were doing in the course work. I couldn't get into ongoing research programme of the unit, I joined. It was a struggle to take up something worthwhile on my own and to complete Ph D.

Career selection after completing Ph D was a more difficult one. Either one had to go abroad for a post doctoral position and postpone the problem of getting a more regular academic/research position or look for opportunities outside one's research area. I chose the latter. Space Applications Centre at Ahmedabad was looking for a physicist willing to work on the emerging area of space borne remote sensing. I took it up although it was far removed from 'TIFR research'. for inventory of natural resources of a diverse country like India was a challenging task. Broad perspective and an open mind to address any problem acquired at my TIFR stay helped a great deal in carrying this entirely new type of work. Application of satellite data in various natural resource areas such as agriculture, snow & glaciers, coastal zone, fisheries etc. and to ensure its actual utilisation became my responsibility. Youngsters from different disciplines were joining the group. I assumed leadership and began to play mentorship role. Interface with very diverse disciplines and role of satellite data in addressing their problems became my task and obsession. I was instrumental in demonstrating use of maiden Indian remote sensing satellite data for various nationally relevant applications. Establishing institutes in different States of the country and training the young scientists in this upcoming field was an important task. Indian Remote Sensing Program became a model program in demonstrating usefulness of a very advanced space technology for societal benefits of a developing country. This took me to a great deal of international collaborations, occupying

Interviews



Interview of Dr. Ranganath Navalgund continued...

positions of responsibility within the organization and in defining frameworks of policy and programs of space activities in the country.

KP : Learnings and insights from your overall experience that will be useful to TIFR community and particularly to the youngsters

RRN : Career in research may look very romantic when one just joins. It is a very hard grind, and takes deep commitment. You may not always get to do what you wanted to do. One should be prepared to change, accept newer challenges and take a broader perspective of science than getting bogged down to very narrow areas of interest.

KP : Your experience of getting into TIFR

RRN : Having been in IIT, Bombay, I had heard of TIFR, although I had never been there. Those days there was no written test for admission at TIFR. All of us called for the interview were asked to sit in the ground floor lounge near the West canteen. View of the sea was breath taking. I was quite impressed by the building; overall get up of the lounge, the paintings and the beautiful lawns. I was dreaming to be selected. I was asked to go to a small room on the first floor where there were six to seven faculty members. Interview was very informal. I never could guess whether my answers were right or wrong.

In the afternoon I was told that there would be another interview and should wait. It was late in the evening, I was asked to go to the fourth floor. There were more senior elderly members sitting quite leisurely. There was quite a bit of discussion on what I want to do for research rather on trying to test my physics background. I still vividly remember Prof Swarup trying his best to interest me on the subject of how to communicate if I were to be on the moon with the earth. After a few days, I got a telegram informing my selection for the Visiting Membership.

Interviews



Interview of Dr. Ranganath Navalgund continued...

It was a very strange designation for a Ph D student. They were paying Rs 450/ per month much higher than Rs 250/ per month a Ph D student was getting in an IIT or university. By then I had offer of pursuing Ph D at IISc, Bangalore and also joining BARC Training School. Choice was obvious.

KP : Life in TIFR with some most memorable experiences (anecdotes)

RRN : Best part of my life/career has been that spent in TIFR during mid 1970 to mid 1977. Except for the initial part (when we had to stay outside), our stay in TIFR and it's hostel was just great. We were comparatively a large batch of students who joined in 1970. If not mistaken we were 22 to start with. Some left since they did not get area of research of their choice. In general, looking back, I feel we took more time to become traditional TIFRites. There are one or two incidents (nothing scientific about them) which are still fresh in my mind. We were young and brash. We started playing tennis ball cricket on the sacred lawns of the institute which was perhaps unthinkable in TIFR. So, promptly we were reprimanded by the Registrar. Sometime later to channelize our energy, the Professor in charge of graduate students prevailed on us to form a group and start our own colloquia. In view of my soft disposition, I was made the Convenor. I had to pay a price for this. Around that time everybody in the institute got a rise in their salaries. It was not applicable to us, the students. My fellow graduate students goaded me as their Convenor to approach Dean, Physics Faculty, Prof. R. R. Daniel at that time to plead our case. My god! I really got tongue-lashing on the issue and was asked to concentrate on research.

It was also a memorable year to join, since it happened to be the Silver Jubilee year of the institute. We had inspiring lectures /visits by many Nobel Laureates in the institute. Over all it was a very important phase of our career and life in general. Many tender romances developed and mostly culminated in tying the knots.

Interviews



Interview of Dr. Ranganath Navalgund continued...

Jiten Goswami and I used to occupy rooms next to each other in the hostel and also spent time together in frequenting cinema halls and restaurants whenever possible. I must also mention the name of Chandrahas Bansal, the Prince, third member of the gang (He is a Senior Professor at the University of Hyderabad). It was a great feeling for both Jiten and me to stay next to each other as neighbours after nearly thirty years in sprawling bungalows of PRL and SAC in Ahmedabad (2005-12).

KP : Functioning of TIFR during your stay in TIFR and later if associated directly or indirectly

RRN : Looking back, I feel functioning of TIFR was ideal for a research institute of its stature those days. It had liberal, intellectual and informal atmosphere. Ambience within the institute and the surroundings was just great. Many lectures and colloquia given by faculty from within the institute and from outside including those coming from abroad were inspiring. They broadened our horizon. There were not much of hierarchical issues. After leaving TIFR in 1977, I have not had much to do with TIFR. It is a long time now. I really do not know it's present functioning.

KP : Advice and suggestions to the students, faculty and alumni of TIFR

RRN : All those who have spent time as students in TIFR stand out in any gathering. So, it is a great opportunity to be in TIFR. Make the best of it. Leave your imprint. Never hesitate to explore new careers. Networking amongst alumni is not as much as desirable. We need to strengthen it. For faculty, I dare not say anything.

Ranganath Navalgund

TAA Red.Com webportal



Realizing the need for a dedicated portal for alumni, TAA has initiated the installation of a portal with the help of IT company Red.Com, who are kind to provide free operation and maintenance of the portal. Red.Com would however, charge a nominal fee of Rs. 100/- per year to members who would like to upload their homepages on the portal.

The portal is active since last 3 months and almost all members who have email addresses have registered on the portal. The portal is linked to the TIFR site; www.tifr.res.in/-alumni. We thank the Registrar and Director TIFR for the approval of Red.Com services for the TAA portal.



kindly visit TAA web portal
<http://www.alumni.tifr.res.in>

For further details and any help, if required, please contact any one of the following who administer the TAA web portal.



*Prof B S Acharya,
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*Kausalya Srinivasan,
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*Nilesh Kulkarni,
DCMPMS, TIFR
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Awards and Honors :



National and International

- ◆ Prof. Yamuna Krishnan: Awarded the Shanti Swarup Bhatnagar Prize for Science & Technology” in the area of Chemical Sciences for the year 2013, by the Council of Scientific & Industrial Research, New Delhi.
- ◆ Prof. Eknath Ghate: Awarded the Shanti Swarup Bhatnagar Prize for Science & Technology” in the area of mathematical Sciences for the year 2013, by the Council of Scientific & Industrial Research, New Delhi.
- ◆ Prof. Amol Dighe: Awarded the Shanti Swarup Bhatnagar Prize for Science & Technology” in the area of Physical Sciences for the year 2013, by the Council of Scientific & Industrial Research, New Delhi.
- ◆ Prof. K. Vijayraghavan: Awarded Padma Shri in the category of Science and Engineering for the year 2013 by the Government of India.
- ◆ Prof. Mustansir Barma: Awarded Padma Shri in the category of Science and Engineering for the year 2013 by the Government of India.
- ◆ Prof. Eknath Ghate: Elected as a Fellow of the Indian Academy of Sciences, Bangalore.
- ◆ Prof. Ravi A. Rao: Elected as a Fellow of the Indian Academy of Sciences, Bangalore.
- ◆ Prof. M. Krishnamoorthy: Elected as a Fellow of the Indian Academy of Sciences, Bangalore.
- ◆ Prof. Amol Dighe: Elected as a Fellow of the Indian Academy of Sciences, Bangalore.
- ◆ Prof. B. J. Rao: Elected as a Fellow of the Indian Academy of Sciences, Bangalore.
- ◆ Prof. Indranil Biswas: Selected for the J.C. Bose Fellowship award by the Ministry of Science and Technology, New Delhi.
- ◆ Prof. J. B. Udgaonkar: Elected as a Fellow of TWAS, The World Academy of Sciences for the advancement of science in developing countries, Trieste, Italy.
- ◆ Prof. D. Mathur: Elected as a Fellow of TWAS, The World Academy of Sciences for the advancement of science in developing countries, Trieste, Italy.

Awards and Honors :



National and International

- ◆ Prof. Shiraz Minwalla: Awarded "The Infosys Prize 2013" for Physical Sciences for his pioneering contributions to the study of string theory, quantum field theory and gravity, and for uncovering a deep connection between the equations of fluid and superfluid dynamics.
- ◆ Prof. Shiraz Minwalla: Awarded the "New Horizons Physics Prize" by the "Fundamental Physics Prize Foundation" for his pioneering contributions to the study of string theory and quantum field theory.
- ◆ Prof. N. K. Mondal: Conferred with the degree of "Doctor of Science (Honoris Causa)" by the University of Burdwan in recognition of his contribution to the promotion of science education and research in the country.
- ◆ Prof. S. Mazumdar: Elected as a Fellow for the year 2013 for his outstanding scientific contributions by the National Academy of Sciences, India (NASI), Allahabad.
- ◆ Prof. T. P. Singh: Received the second prize for his essay 'Information and the foundations of quantum theory' in the essay contest "It from Bit, or Bit from It?" conducted by the Foundational Questions Institute (USA) .
- ◆ Prof. V. Srinivas: Humboldt Foundation Award, Germany, in recognition of lifetime achievements in research.
- ◆ Prof. P. Joshi: Awarded Prof. A.C. Banerji Memorial Lecture Award (2013) & the Medal of the Academy for his outstanding scientific contributions by the National Academy of Sciences, India (NASI), Allahabad.
- ◆ Prof. Shashikumar M. Chitre: Awarded the Padma Bhushan in the category of Science and Engineering for the year 2012 by the Government of India.
- ◆ Prof. M.S. Raghunathan: Awarded the Padma Bhushan in the category of Science and Engineering for the year 2012 by the Government of India.

Awards and Honors :



National and International

- ◆ Prof. Jayashree Ramdas: Awarded the Third World Academy of Sciences Regional Prize 2011 for development of scientific educational materials.
- ◆ Prof. Jayashree Ramdas: Elected member of the IUPAP International Commission on Physics Education (ICPE) for the period 2011-13.
- ◆ Prof. Arvind Kumar: Awarded Padma Shri in the category of Literature and Education for the year 2010 by the Government of India.

Awards and Honors :

Cowsik Awards 2013



Dr Neena Gupta
Saraswathi Cowsik Medal

“On Zariski’s Cancellation Problem in positive characteristic” to appear in Inventiones Mathematicae

Dr. Neena Gupta receiving the Saraswathi Cowsik award,
2013 from Prof. M. Barma, Director, TIFR



Dr. Sudhirkumar U. Yanpallewar
Ramakrishna Cowsik Medal

“Blockade of α 2-Adrenoceptors speeds up Antidepressant Action” which appeared in the Journal of Neuroscience

Awards and Honors :

TAA best thesis awards 2011-2012



Name of the Award: TAA-Geeta Udgaonkar
Recipient : Tridib Sadhu
Thesis Title: Emergence and Complexity in Theoretical Models of Self Organized Criticality
Name of the Guide: Prof. Deepak Dhar

Jointly to:

Name of the Award: TAA-Geeta Udgaonkar
Recipient : Dr. Prerna Sharma
Thesis Title: Dynamics of interfaces
Name of the Guide: Prof. Shankar Ghosh

Name of the Award: TAA-Harish Chandra Memorial
Recipient : Dr. Ronnie M. Sebastian
Thesis Title: Some Topics Algebraic Geometry
Name of the Guide: Prof. V. Srinivas

Name of the Award: TAA-Sasken Best Thesis Award
Recipient : Dr. Kishore Barman
Thesis Title: Topics in Collaborative Estimation & MIMO Wireless and Communication
Name of the Guide: Dr. Onkar Dabeer

Jointly to:

Name of the Award: TAA-Sasken Best Thesis Award
Recipient : Dr. Sameer Kamal
Thesis Title: Application and Analysis of Stochastic Approximation Algorithms
Name of the Guide: Prof. V. S. Borkar

Awards and Honors :

TAA best thesis awards 2011-2012



Name of the Award:	TAA - Zita Lobo Memorial Award
Recipient :	Dr. Adil Ghani Khan
Thesis Title:	Studies of the Rat Olfactory System: Coding and Neuroethology.
Name of the Guide:	Prof. Upinder Bhalla
Honourable Mention:	
Name of the Award:	TAA - Zita Lobo Memorial Award
Recipient :	Dr. Suman Nag
Thesis Title:	Amyloid Beta: Misfolding, Aggregation and interaction with Cell Membranes
Name of the Guide:	Prof. Sudipta Maiti

Awards and Honors :



TAA best thesis awards 2012-2013

Name of the Award: TAA-Geeta Udgaonkar
Recipient : Dr. Vibhor Singh
Thesis Title: Quantum Hall effect and electromechanics in graphene
Name of the Guide: Prof. Mandar Deshmukh

Jointly to:

Name of the Award: TAA-Geeta Udgaonkar
Recipient : Dr. Sayan Chakraborti
Thesis Title: Feedback from Supernovae
Name of the Guide: Prof. Alak Ray

Name of the Award: TAA-Harish Chandra Memorial
Recipient : Dr. Shyam Sundar Ghoshal
Thesis Title: Finer Analysis of Characteristic and its Application to Exact, Optimal Controllability, Structure of the Entropy Solution of a Scalar Conservation Law with Convex Flux.
Name of the Guide: Prof. G.D. Veerappa Gowda

Name of the Award: TAA - Zita Lobo Memorial Award
Recipient : Dr. Arpan Kumar Rai
Thesis Title: Understanding Collective Force Generation in Intracellular Transport.
Name of the Guide: Prof. Roop Mallik

Honourable Mention:

Name of the Award: TAA - Zita Lobo Memorial Award
Recipient : Dr. Pranav Shirhatti
Thesis Title: Multifaceted nature of C-H ... Y hydrogen bonds unravelled using laser spectroscopic techniques in gas phase.
Name of the Guide: Prof. Sanjay Wategaonkar

Awards and Honors :

List of the Patents awarded by TAA 2012



Sr no	Title	Inventor
1	Preloaded parabolic dish antenna and the method of making it.	Prof. Govind A Swarup/ Shri S. C. Tapde, NCRA
2	Chromium dioxide (CrO ₂) and composites of chromium dioxide and other oxides of Chromium such as CrO ₂ /Cr ₂ O ₃ and CrO ₂ /Cr ₂ O ₅ and process for manufacturing the same	Prof. Arun Nigam/ Ashna Bajpai, TIFR
3	Prism Mount Adapter	Prof. S.V. Kumar, Shri S.T. Tare, TIFR
4	A Novel assay for screening antipsychotic drugs	Prof. M.M. Panikar, Prof. S. Bhattacharyya, TIFR
5	Fluorescence correlation microscope with real time alignment readout	Dr. Sudipta Maiti, S.K. Kaushalya, Kanchan Garaj, Jaiprakash Balaji, TIFR
6	A composition useful in developing an artificial bone marrow-like environment	Prof. L.C.Padhy, TIFR

Awards and Honors :

Patents awarded by TAA 2012 : images



Preloaded parabolic dish antenna and the method of making it.
Prof. Govind A Swarup/Shri S. C. Tapde, NCRA



Awards and Honors :

Patents awarded by TAA 2012 : images



Chromium dioxide (CrO_2) and composites of CrO_2 and other oxides of Chromium such as $\text{CrO}_2/\text{Cr}_2\text{O}_3$ and $\text{CrO}_2/\text{Cr}_2\text{O}_5$ and process for manufacturing the same.

Prof. A.K. Nigam/ Dr. Ashna Bajpai, TIFR



Awards and Honors :

Patents awarded by TAA 2012 : images



Prism Mount Adapter.
Prof. S.V. Kumar/Shri S.T. Tare, TIFR



Fluorescence correlation microscope with real time alignment readout.
Prof. Sudipta Maiti/S.K. Kaushalya/ Kanchan Garaj/Jaiprakash Balaji, TIFR

Awards and Honors :

Patents awarded by TAA 2012 : images



A composition useful in developing an artificial bone marrow-like environment.
Prof. L.C.Padhy, TIFR

Contributory Articles



TIFRAC : A Springboard for Computing Culture and Revolution in India

By Prof R K Shyamasundar



TIFRAC (Tata Institute of Fundamental Research Automatic Calculator) was the first electronic digital computer designed and built in India. It marked the first significant step the country took in the information technology revolution which began in the early 50s in India. This was initiated by Dr. Homi Bhabha who realized the importance of computers in scientific research and information technology in the country. He wanted TIFR to take a lead in this and develop the know-how about computers which resulted in TIFRAC. The design and development of TIFRAC was led by Prof. R. Narsimhan during 1959 to 1964. To quote R. Narasimhan *"The pilot machine, except for its size, was quite in pace with the state of the art in 1954. In 1957, the design of TIFRAC (named in 1962 by Pandit Jawaharlal Nehru, during the opening of the new TIFR buildings) was still not very much behind what was being attempted at that time elsewhere. But by the time it was officially commissioned in 1960, computer technology had surged ahead leaving our machine behind as an obsolete first generation machine."* The rapid strides in semi-conductor technology in the west was a definite factor as to why the drive in India could not be carried forward with the same zeal.

In addition, factors like comprehension of the efforts needed, application ranges and the political climate also played their role in preventing India to take a stride forward in the computer hardware and system manufacturing sector.

Today, looking back, we can definitely say that India's long journey into information technology, whose results are visible around the globe today began through this effort. TIFR's landmark indigenous effort resulted in two important milestones (i) the setting up of a national computational facility at TIFR to provide a means of computer access to a broad spectrum of Indian scientists and engineers and (ii) the establishment of the indigenous manufacturing of computers at ECIL through the TDC series of computers.

1. Digital Computer Scenario in early 50's

1.1 International Scene

The commissioning of ENIAC in 1943 at the Moore School of Engineering, University of Pennsylvania, heralded the digital computing era. Programs were represented by plugged interconnecting wires and had full conditional branching facilities. Subsequently, programs were represented by setting of function tables without the need for changing the interconnecting cables. This allowed the programmer to think of the machine as a sequential machine and ignore the problems of co-coordinating parallel activities. Memory extensions were carried out and ENIAC remained in use till October 1955. While ENIAC was faster than any other existing computer, the time required for setting up the problem

Contributory Articles



By Prof R K Shyamasundar continued...

dissuaded its usage for problems that did not require extensive computation. To remove this pitfall, the team embarked on a new computer EDVAC. The main drawback of setting up the problem was overcome in EDVAC through the notion of a stored program concept --envisaged in a report by John von Neumann. The design took great advantage of the fact that a program could read and modify itself. However, the lasting contribution of the stored program concept was that it made it a practical and an attractive proposition to use a computer to assist with the preparation of its own program – thus leading to the development of programming tools/aids such as assemblers, compilers, operating systems etc. EDVAC was commissioned at the Ballistic Research Laboratory in 1947 and continued its operation till 1962. Other important effort worthy of recollection is the effort towards a stored program computer EDSAC at Cambridge University, UK. It started in 1947 under the leadership of Maurice V Wilkes and became operational in 1949. One of the most significant contributions of the effort was the set of “initial orders”, a wired-in program that provided what would now be called a rudimentary assembler and loader. Within the next few years several stored program electronic computers were successfully built in USA and other places and the computer industry started to emerge. New technologies developed and computers increased enormously in speed and capacity, and were used for an ever growing variety of applications.

1.2 Effort at TIFR: Design and Implementation of TIFRAC Design

The origin of the effort at TIFR was due to Dr. Homi Bhabha’s philosophy of developing internal competence in high technology areas by designing, developing and implementing sophisticated systems rather than by merely procuring and using them. He initiated, in 1955, the building of India’s first digital computer under the leadership of Dr. R. Narasimhan who had joined TIFR with a doctorate in Mathematics. As was his style, Homi Bhabha entrusted the challenge to the scientific group and did not interfere in their activities.

The effort was led by R. Narasimhan and had the following members: B.K. Basu, P.V.S. Rao, T.R.N. Rao, M.M. Dosabbhai and V.K Joglekar for Arithmetic and Control, S.P. Srivastava, R.N. Neogi and B.B. Kalia for Memory, K.L. Bhakhru for Input-Output, D.S. Kamat for Magnetic Drum, P.V.S. Rao and R.R. Nargundkar for text and graphics display, M.M. Farooqui and D.F. Cooper for Power supply and K.S. Kane for Software.

For a group of novices with little training and less information to help them, attempting to design a full scale computer straight away could well have been a recipe for disaster. For this reason, the group decided to build a ‘pilot model’ of the computer to start with. The pilot model was to be a testing, educational, training and proving ground for the researchers and their ideas. This pilot model was completed in less than two years, in late 1956. With the competence and self-confidence gained in that exercise, the group designed and built a full-fledged machine in about three years.

Contributory Articles



By Prof R K Shyamasundar continued...

TIFRAC (TIFR Automatic Calculator) was the name given to this machine by Prime Minister Jawaharlal Nehru, when he inaugurated the new TIFR building, in 1960.

TIFRAC was designed on the general principle of John von Neumann's classic report of the Institute of Advanced Studies (IAS) and thus belonged to the category of IAS type of machines. The reader is referred to [1] for details of the design and fabrication, and to [3] for an account from one of the participating member, PVS Rao along with the highlights of the efforts that followed TIFRAC. Further, [2] provides a roadmap of the growth of computing and IT from TIFRAC days to the time of centenary celebrations of Dr. Homi Bhabha. Some highlights of TIFRAC are given below from these references.

Highlights of TIFRAC

a. The Pilot Model was a parallel, asynchronous, fixed point, single address machine with a word length of 12 bits and a two dimensional Ferrite Core memory of 256 words. Input and output were accomplished via paper tape and Teletype. The total power consumption of this machine was about 10kW.

b. The full scale system (TIFRAC) had a 40 bit word length and a three dimensional ferrite core memory of 2048 words. With a cycle time of $15\mu\text{s}$, it was better than the IBM 701. In fact, it had a state-of-the-art three dimensional magnetic core memory system which was designed and put together in TIFR. Addition took only a few microseconds; multiplication and division took much less than a millisecond each.

Input and output were by paper tape and a

a standard teletype unit running at 50 baud (7 characters per second). It had 2700 vacuum tubes, 1700 germanium Diodes and 12,500 Resistors. It occupied a floor area of approximately 4000 square feet and had a power consumption of well over 20 KW.

c. R. Narasimhan and K. S. Kane developed the first assembler for TIFRAC. These were written in a series of commands of 1's and 0's in comparison to an Operating System of today which has a host of applications with graphic interfaces, enabling almost anybody to use a PC with ease. It was almost certainly the first item of system software to be implemented in India.

d. Since the memory could not accommodate a compiler, the group implemented a three address interpretive routine for floating point arithmetic. This incorporated several features which were especially useful for inversions of large matrices

e. Innovations in TIFRAC: Some of the features in TIFRAC were very original and innovative and few are highlighted below:

◆ The Memory Unit: Those were the days when magnetic core memories had just become possible. (Earlier computers had used Acoustic Delay Lines and Cathode Ray Tube capacitor memory systems which were very fragile and inconvenient; being volatile, they had to be frequently refreshed). The TIFR group opted for magnetic core memories, but readymade memory assemblies were not available at that time. Not to be deterred, the group procured the miniscule magnetic cores and built its own memory system using them. The team actually strung the memory matrix

Contributory Articles



By Prof R K Shyamasundar continued...

matrix together, designing the special plexi-glass frames, and threading the hair-thin enameled wires through the sub-millimeter magnetic ring cores – eighty thousand of them. Each core carried four wires! It was the careful design, engineering skill dexterity of this team that accomplished this challenging task.

- ◆ **Computer Arithmetic:** Several innovations for fast addition were realized through Rao-Basu Adders etc.

- ◆ **Electronic Display of Text and Graphical Information:** Computers of that time used slow electromechanical devices such as steele type writers as the standard output medium. TIFRAC boasted a very futuristic visual display with textual and graphical output. Such displays became available in commercial machines only much later. TIFRAC used a very original (flexible, line segment based) display strategy for alphanumeric characters

1.3 Usage

TIFRAC which was operational by early 1960 continued to be heavily used till 1965 (in academics, by R&D organizations, Industry, business). Within a year or two of TIFRAC's operation, it was clear that demand for its use was growing so fast that it would exceed capacity within five years of its commissioning, both in volume and speed. The machine was put on two shift operation to meet this demand. In fact, the usage is distinct and unique compared to other initiatives of instrument building activities at TIFR and also the computational building efforts slightly later at the Indian Statistical Institute.

1.4 Efforts at Indian Statistical Institute (ISI, Calcutta) and Jadavpur University (JU)

The Indian Statistical Institute and Jadavpur University jointly undertook the design of a transistorized computer in the early 1960's and completed it in 1966. This machine, called ISIJU, was in operation for several years and provided computational facilities for the two institutions. The effort triggered the formation of a strong computer science group in Jadavpur University; it must be pointed out that the efforts at ISI led to several excellent research works particularly in computer arithmetic.

Discussions

Needless to say that building TIFRAC was a credit-worthy achievement in itself. However, the impact of this activity went far beyond the immediate one time benefits that could accrue from the availability of such a machine in a developing country. It influenced the growth of computer technology, computer awareness and utilization in a positive and phenomenal manner over a much wider field and for a much longer time than one would have expected. Above all, it enabled the building up of a strong group of competent first generation computer professionals and laid a foundation for computing culture in India. In the context of India becoming Global Software Leader and the climate conducive for manufacturing, let us hope to see the next revolution for the manufacturing sector in India soon and see India as a fully developed nation.

Contributory Articles

By Prof R K Shyamasundar continued...



References

1. R. Narasimhan, On the System and Engineering Design of the General Purpose Electronic Digital Computer at TIFR, Proc. Indian Academy of Sciences, Section A, Vol. 52, Aug. 1960, pp. 45-57
2. R.K. Shyamasundar and M.A. Pai, Homi Bhabha and the Computer Revolution, Oxford University Press, 2011.
3. PVS Rao, Homi Bhabha and Information Technology in India TIFRAC- India's First Computer, in [2].



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Contributory Articles

'Patrick Braggs'

By Dr Suresh Chandvankar



Stepped out of the lift. Noticed a new paper on the colony notice board. Few hand written words in red bold letters. 'Going out of town for a month. Shall return as soon as the work gets over. Very very sorry for the inconvenience'. Three line message for committee members and the residents. Signature – 'Patrick Braggs'. Oh! This is our Patrick? Never saw his hand writing in last thirty five years and never knew his surname.

Patrick! Self declared 'Cleanliness Director' of Tata Institute of Fundamental Research, (TIFR) colony and office, the premier research institute of India located in South Mumbai. Working since the days of late Dr. Homi J. Bhabha (1909-1966). Black or blue shorts, most of the time below waistline, rest bare body, water filled bucket in one hand and mop or broom in the other. Half sleeve T-shirt, only when resting or going out. Always in a great hurry. Machine gun of words set in the mouth and always on, no matter if there are listeners around or not. Day begins much before dawn. Sweeping the corridors, stairways and lifts of a ten storey building, pulling the trolley loaded with garbage drums to the scrap yard located near sea-shore is the first task. All alone if the colleagues do not turn up in time. Then trip to canteen. Hot tea cup with a topping of small Amul butter cake. The molten butter would form a transparent liquid floating on top. Then a piece of bun bread would get soaked in it to make a delicious dish.

After this unusual light breakfast, work in the office would begin. Department, 'Cosmetic Maintenance - nature of work Zadupocha'. The term 'work efficiency' could best be defined using his work as a yardstick.

No matter if anyone appreciates or not, whether the work gets converted into promotions or awards and rewards. Always work-o-holick. Cleaning of lift cars in the evening, after office hours.

Main doors, lift floors must be spotless clean. Brass handles and brass buttons must be shiny like a mirror. No matter how many bottles of 'brasso' liquid and heaps of cotton waste would be used up. Immediate response upon comment or remark, "Do you know Sir? This is the place where Dr. Bhabha patted me on the back and said, 'Patrick! These lifts should always be glittering even when I am not there.' He went away and never returned. Some say his body is not found yet. If he really returns and enters the lift, shouldn't these be shining as he wanted?" This was the main driving force in all his acts. He would never allow anyone to clean up the lift cars till he was in the service.

Late in the evening and again in the service of the colony residents. Just across the road. Cleaning and washing the cars with one eye on the children playing around. He would then take out a huge hose from the common bathroom to wash and mop the huge floor in the colonnade area.

Contributory Articles



Patrick Bragg's continued

Even in the days of heavy water cuts and shortages, no one would dare to stop or scold him or object. No talk and gossips during this work. One would wonder about his lunch, but dinner used to be quite heavy.

Two Tiffin, a piece of a fish or mutton mandatory and of course a small flat bottle for booze. With couple of pegs in stomach, he would relax and forget all the labor of the day and the stingy and pungent garbage smell. After wonderful meals he would settle on stairs or in verandah with a tobacco or pan. If one is strolling in the corridors after dinner, he would follow with his radio station on. You have to just listen to him and give a push if he begins to detune or distract. 'Who has gone abroad or who has returned? how he gave me foreign shirt and a bottle of 'English' liquor? Who has recently bought a flat or house and how much did he pay? What is the current market value and rent? And how much rent is he getting? Whose daughter is roaming around with her lover and how is it that her father doesn't know?' Topics and the subjects would change depending on his mood and also on the amount of booze he had and its effect. If no one is around, then he would keep talking to himself, or sing his favorite songs loudly. Often he would end up in big laughter episodes before going to bed in the basement. Next moment he would begin to snore loudly. In summer, he would set his bed in the terrace. All his belongings in a small tin trunk and kept in the basement.

This schedule is on for last fifty years. Patrick came to Mumbai when he was around twenty years old. He learnt to speak Marathi and Hindi with expertise in the abuses and strong slangs. He would communicate fluently with all the cleaners, colleagues and the maids

around. Always ready to help the residents moving in or leaving the campus. If invited for his help in any function in the basement or flat, he would work like a family member with all kind of labor and the work involved. It would then be his responsibility than that of the host.

In one monsoon, winds were blowing heavily and I forgot to bolt the kitchen door. It slammed so heavily, that full size glass window broke and drawing room was full with shattered glass pieces. He was working in the corridors and came running after listening the big bang. Somehow I managed to reach the door without hurting my feet. He saw the scene and said, 'This happens at least once in every flat. People don't learn a lesson till then. Don't worry. All of you go and sit on the bed and leave the door open. I am coming with broom and the mop'. I followed his advice and within few minutes he cleaned up the floor thoroughly. No one would have believed about the accident but for the empty door frame with no glass. This was a routine for him and he was always contended with whatever you offer him. Never argued for the wages. If colleagues would talk about strike or 'no work', or 'go slow' tactics, then he would shout at them, 'First do your work honestly and properly. Then let me see how we don't get a proper pay'. No one would ever argue against his logic.

Every year, Patrick would participate and enjoy two important events in the colony viz. the Independence Day and the Republic Day. He would be after the Chairman in the office for all details - whether the flag pole is coated with white oil paint or not? Who has the tricolor flag? Is it ironed properly? What about the mock trial taken prior to the day of

Contributory Articles



Patrick Bragg's continued

celebrations? He would pester and get all the details worked out to his satisfaction. Soon after flag hoisting and mass singing of 'The Anthem', he would disappear to return only in the evening. In this ceremony of removing the flag, often he would be alone. He would remove the flag ceremonially and hand it over to the concerned resident.

'Funny Patrick Uncle'! This is how he is known to children in the colony. He would see his own childhood in their company and would never scold or scare them. If someone is found throwing paper flag on floor, then he would go and ask the kid to pick it up and give due respect. If someone is injured he would rush to pick the kid up, provide with the first aid and all help needed. If serious, he would take the kid to Doctor even before the concerned parents would know. Batches of children and research scholars have grown and left colony under the kind and loving supervision of Patrick uncle. They never forget him. Whenever they visit campus, they do inquire and meet him with nice gifts. He is on their blogs and they do share 'Jokes of Patrick Uncle' on social communication sites.

Now, Patrick has crossed seventy-one and moving forward with the same vigor. He is enjoying his pension for last eleven years and hopes to continue till the century of his life. Even after his retirement, he lives in the same basement and not prepared to leave. Recently he had to undergo major surgery at Jaslok hospital for the replacement of his hip bones. He was admitted for two weeks and became popular in the ward. He was advised one month rest. But he quarreled with the doctors and argued that 'Lot of work is pending in the colony and these new recruits are good for nothing. So, I must go'.

Finally, he persuaded doctors and came out only to get on to his work. He never gets tired.

His ninety years old mother and seventy years old sister are in Mangalore in an old age home. Mother passed away recently and he had now gone to meet his sister. He has also a small flat in Badlapur, suburb of Mumbai, some fifty km. on Mumbai Pune rail road. He goes there once a month, early in the morning, cleans up his own house and returns to Colaba well before evening. New residents and committee members do not entertain him. They advise him to go back and rest. But he is not prepared to leave. What can he do? He is still bound to the promise he has made to Dr. Bhabha long ago.



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July 25, 2011

TIFR Alumni News



Annual General Meeting held on March 22, 2013



Annual general meeting of TAA being conducted by the TAA Presidents , Prof. B. M. Arora (past) and Prof. R. Pinto (present).

Amendments in the Constitution of TAA approved by AGM of March 22, 2013:

1. Management of the Association:

- ◆ The elected members of the Executive Committee (EC) may co-opt up to 10 additional members into the EC, from among existing members of the TAA attached to TIFR (Mumbai) as well as from the other Centres associated to TIFR (namely, HBCSE, NCRA, NCBS, CAM, ICTS and TCIS). It is desirable that there be at least one member co-opted from each Centre.
- ◆ One of the co-opted-members must be a currently registered Student, who must be an Associate Member of TAA.
- ◆ The President and at least four of the elected members of the Executive Committee shall not be current members of TIFR.
- ◆ The term of the Committee shall be for a period of three years.

2. Eligibility for Membership:

Membership of the TAA shall be open to Research Scholars of TIFR and its Centres, provided such students have registered for M.Sc./Ph.D. Registered research scholar would be eligible to become an Associate Member, who would have full voting rights. Such Associate Membership would get converted to regular membership on the Research Scholar completing his/her degree, or get cancelled otherwise.

TIFR Alumni News



Felicitation of Prof. Mustansir Barma for receiving the Padmashri Award, 2013.



Prof. M. Barma, Director, TIFR being felicitated by TAA past president, Prof. B. M. Arora



Prof. M. Barma, Director, TIFR being presented by a bouquet from TAA past president, Prof. B. M. Arora

Felicitation of Prof. M. Multani on the occasion of his 75th birthday.



Prof. M. Multani, being felicitated by TAA past president, Prof. B. M. Arora



Mrs. Multani, being presented by a bouquet from TAA past president, Prof. B. M. Arora

TAA Executive Committee 2013-2016



- ⇒ President : Prof. R. Pinto
- ⇒ Vice President : Prof. Vijay Singh
- ⇒ Secretary : Prof. Ravi Rao
- ⇒ Treasurer : Prof. B. S. Acharya
- ⇒ Co-opted members : Prof. B.M. Arora
Prof. Pushan Ayyub
Prof. A. K. Grover
- ⇒ Co-opted Associate Member : Dipankar Nath
- ⇒ Members : Dr. R.S. Chaughule
Dr. Champakali Ayyub
Dr. Radha Srinivas
Dr. Sangita Bose
- ⇒ Admin Secretary : Ms. Margaret D'Souza



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