TIFR ALUMNI ASSOCIATION

October 2012

Sampark

TAA Newsletter

In This Issue

K.P. Singh

Aravind Chinchure

"Editors Message"

Recognizing the need for TAA members to remain connected, a regular publication of TAA Newsletter: SAMPARK was launched in the year 2001 and was produced annually until 2008. It was a generous donation by late Prof. Karamjit Arya that had helped us start the print edition of SAMPARK. Later editions were partly subsidized by SASKEN, TCS and TIFR until 2007. In 2008 we switched to the online edition only. It carried news and excerpts of public lectures (which we are now trying to move entirely to the Vimeo – a multi-media site for a larger public exposure).

In a recent executive council meeting of the Alumni Association, it was decided to re-launch SAMPARK (online only) in a new avatar by including the life and work of some of the most accomplished alumni of TIFR along with other new features. Our goal was to make SAMPARK not only a compelling read but also something that you would like to preserve it for your future reading. In this issue of SAMPARK, we are delighted to share with you work and life of very distinguished TIFR alumni – Prof. M.S. Raghunathan, Prof. B. M. Udgaonkar, Prof. S. M. Chitre, and Prof. Ram Ramaswamy. We also report our conversation with Prof. Doehler, one of the distinguished visitors to TIFR. We have also added another feature by name "Alumni Entrepreneurs" where we share brief details of new ventures started by TIFR alumni. We hope that your will like this issue of SAMPARK which contains some original, insightful and inspirational stories. We also request your contribution to make the next issue equally exciting.

We would also like to welcome the involvement of students in the affairs of TAA. In the words of Aparna, one of the senior students of TIFR: "*Students could participate in efficient management of TAA's activities such as web-page management, maintenance of electronic and print media concerning TAA. In this way, a symbiosis between the present and the past could be achieved that would define the future alumni*". Efforts must be redoubled to get more and more students registered with the TAA. TIFR graduate school can play a major role in this effort.

Happy reading!

K.P. Singh and Aravind Chinchure

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We Thank !

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for all their efforts in designing this newsletter.

Please share with us your feedback on this issue of ***SAMPARK.***

Mustansir Barma

"From The Patron's Desk"

I am very happy to see that this issue of the newsletter of the TIFR Alumni Association carries several new features of interest to the readership. The interviews with our eminent alumni make for very interesting reading and give us a glimpse of how their careers in science evolved, especially the role of the Institute in this evolution. Besides, the newsletter carries news about alumni and about the best Thesis Award winners amongst students, etc.

I am appreciative that the TAA has been active on many fronts. Notably, TAA has organized Public Lectures by Alumni at the Institute in a sustained way over the years. Further, during the Homi Bhabha Birth Centenary period, the TAA recognized several of our distinguished alumni through excellence awards. This is an initiative which could be encouraged to continue in future as well.

The newsletter seeks to provide a link between Alumni, and between the Alumni and the Institute. In its new avatar, I believe that it would be able to increase its reach, and achieve and expand its goals. I look forward to the issues to follow with keen anticipation.

Mustansir Barma

Director, TIFR and Patron, TIFR Alumni Association

B.M. Arora

"TAA PRESIDENT'S MESSAGE"

Greetings and good wishes to all of you!

It is heartening to see that the editorial team of K P Singh and Aravind Chinchure has managed to bring "Sampark" to you after gap of few years. TIFR Alumni are spread all over the country as well as in many parts of the world. So, we felt it important to be in touch with you and to bring you close to each other as well as the Institute. This issue of Sampark brings to you interviews with some eminent alumni as well as news from the TIFR Constituents. We shall be happy to have your comments and suggestions.

Among the key activities, TAA organizes public lectures to reach out to schools, colleges, and members of public for advancing the spirit of science; and provides forum for recognizing excellence through various awards (Best Thesis Awards, Patent Awards etc.). Two new awards are being instituted for recognizing high quality research work by TIFR Scientists.

Membership of TAA is expanding with continuous flow of Research Scholars. Recognizing this, the TAA Executive Committee has started co-opting a member representing Research Scholars.

We feel certain that links between TIFR and Alumni will become stronger as the Alumni spread out into the world. We look forward to your support and contributions to make this happen.

B.M. Arora

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Interviews

Prof. M. S. Raghunathan

"These days there is an inadequate emphasis on scholarship in our community. This is a sad trend and needs to be reversed. Outstanding original research can emerge only in a milieu of great scholarship"

Prof. S. M. Chitre

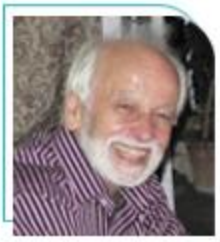
"The ultimate satisfaction that a teacher can derive is when you start learning from the students and they reach a stage in their career when students do better than their teachers!"

Prof. Ram Ramaswamy

"We need to educate millions of people in the next 10-15 years. Not everyone wants to do a Ph.D. But we need to enable millions of people to be educated. For that all of us have to play role."

Prof. B. M. Udgaonkar

"Some of us thought that we should apply the knowledge and methodology of learning and teaching to the conditions here (India), to the people here, to the students here, to the teachers here."



Prof. G.H. Doehler

"My advice to students is, not getting too much focused on refining existing knowledge but rather thinking of viable investigations that have never been done."

"These days there is an inadequate emphasis on scholarship in our community. This is a sad trend and needs to be reversed. Outstanding original research can emerge only in a milieu of great scholarship"

Prof. M. S. Raghunathan

Interview

Prof. M. S. Raghunathan is known to all us for his pioneering contributions in the area of algebraic groups and promotion of higher mathematics in the country. Prof. Raghunathan did his schooling in Chennai and joined TIFR as a Research Assistant and was promoted as an Associate Professor at the age of 25. He is currently Head of the National Centre for Mathematics, Indian Institute of Technology, Mumbai. Recently, Government of India conferred him with Padma Bhushan. Prof. Raghunathan shares his inspiring life and work in response to the questions from TAA Editors.

TAA

How has been your journey from your childhood to early education to research?

Prof. M.S.R

I was born on August 11, 1941 in Anantapur, Andhra Pradesh in the house of my maternal grandfather who was at that time a Professor (of English) at the Government College there.I grew up in Chennai in a prosperous joint family presided over by my grandfather. My father and his brothers were partners along with their father in a family firm which was into timber business. I had my schooling in three different schools in Chennai: The Children's Garden School, P S High School and Madras Christian College. My mother supervised my education, but my father would also occasionally find time to talk science to me and those infrequent sessions were very enjoyable. After my SSC I studied for two years in St Joseph's College, Bengaluru staying in the college hostel and returned to Chennai in 1957 to pursue B A (Hons) degree in mathematics. The Bengaluru interlude was because I was "under-aged" to enter the Madras University - the same age restriction was applied irrespective of the stage at which you entered the university! Colleges in Bengaluru were affiliated to Mysore University at that time and that university did not have any age restriction.

I graduated in 1960 and joined the School of Mathematics of TIFR as a "Research Assistant" on August 1 in the same year. Immediately after I wrote my first research paper in 1963 I was promoted as "Research Fellow" and the next year as "Fellow". In August 1966, I was made "Associate Professor". Each of these promotions were quick responses to research work that I had done. Associate Professorship was regarded as the most important step in one's career at TIFR in those days: with that, among other things, one was given a role in decision-making. The subsequent steps in my career were: (Full) Professor (1970), Senior Professor (1980), Distinguished Professor (1987), and Professor of Eminence (1997). I retired from TIFR in 2006, but continued to work there as DAE Homi Bhabha Chair Professor till August 31, 2011. I am currently a "Distinguished Guest Professor" at IIT Bombay and also Head of The National Centre for Mathematics, a joint venture by IIT and TIFR.

TAA

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

Prof. M.S.R

It is to the TIFR and more particularly the School of Mathematics that I owe whatever I have achieved. When I joined the Institute I was not really committed to the pursuit of mathematics: I was still in the process of deciding what I really wanted to do. I was of course fond of mathematics, but it was by no means an obsession. I enjoyed other subjects as well though I had had much less exposure to them. It is the general atmosphere especially among students that I consider the most important influence in my eventually (in the course of two years) deciding to stick with mathematics. There was a tremendous infectious enthusiasm for mathematics around and discussions with fellow students and faculty raised my enjoyment of mathematics to a new level. I discovered that I had a capacity for hard work (and for enjoying it too) which came as a surprise: all through my undergraduate days I had taken things easy (as a result of which, perhaps my examination performances were never great: it was indeed lucky for me that not much weight was given to this in the selection of students at TIFR). Some individuals of course had a major role in shaping my mathematical career in its formative period: M S Narasimhan who was my guide for my Ph D degree and S Ramanan who was still a student (some three years senior to me) when I joined TIFR. Raghavan Narasimhan and C P Ramanujam were two others who influenced me greatly. Both were outstanding intellects and taught me a lot of the mathematics I picked up in my student days. I admired Raghavan Narasimhan to the point of some kind of hero-worship and perhaps some traits of mine are imitative of his. I was fairly close to him but have had rather limited contacts after he left TIFR in 1966. Ramanujam died in 1975. M S Narasimhan and Ramanan are continuing influences to this day. In the first two or three years, I did not have much contact with Seshadri (who along with M S Narasimhan had become a

member of the Mathematics Faculty around the time I joined), our mathematical interests being somewhat far apart then. Later however we were to become close friends and he too was a kind of role model for me.

TAA

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

Prof. M.S.R

I cannot say that I faced any serious difficulties in my journey. In my earlier days, I found myself in the happy circumstance of finding that other people's assessments of my achievements/abilities were well beyond my own evaluation. However that made me nervous wondering if I deserved such recognition and whether I would be able to justify the confidence placed in me. So the only challenges I encountered were to choose good mathematical problems to work on and of course to solve them. And there I have had a large measure of success; but there were failures too - I spent at least a year's time on each one of three different problems without making any real dent. However these efforts were not without their rewards: I learnt a lot of good mathematics in the process.

TAA

What are your learning's and insights from your overall experience that will be useful to TIFR community and particularly to the youngsters?

Prof. M.S.R

I am afraid that the first thing that I want to say may sound like a platitude - I suppose it is one - but platitudes sometimes come home to you with an amazing force. Hard work is essential for any kind of success in science. And the pursuit of science is meaningful only if it is enjoyable. Incidentally that is no contradiction: hard work can be enjoyable and that in fact would be borne out by a biographical account of any great scientist. In my view a capacity for hard work is an integral part of what we call talent.

These days there is an inadequate emphasis on scholarship in our community. This is a sad trend and

needs to be reversed. In my view outstanding original research can emerge only in a milieu of great scholarship and over the last several decades scholarship has been largely neglected in our institutions of higher learning. This state of affairs is the result of a revolt against our tradition in which commentaries on old works rather than new original ideas dominated our academic pursuits for centuries. But the pendulum has swung too far out in the other direction now with people spending time producing so called original research of indifferent quality and paying no attention to acquiring scholarship. I understand that it is difficult in the present situation where career advancement is predicated on the number of publications, citation index and such like evaluations to pay the kind of attention that needs to be given to scholarship. Graduate students under pressure to complete a thesis within a set period cannot afford to spend time acquiring a wide scholarship. I do hope that TIFR can evolve policies and practices that will overcome these problems and will foster a community of outstanding scholars.

How was your experience of getting into TIFR?

I had not heard of TIFR till after my final exams of my undergraduate course. I came to know of its existence from some friends who told me that they were applying to TIFR for a Research Assistant post. I had no clear idea of what research meant, but applied all the same to TIFR School of Mathematics. I had also simultaneously applied for a Masters Programme in Theoretical Physics as well as in Politics(!) at the University of Madras, a Masters Programme at IISc in Bangalore and for an officer job to Bank of India (It was pre-nationalisation days). The Masters in Politics was with an eye on writing the IAS. I did not get any response from the bank, but secured admission to all the academic programmes. TIFR called me for an interview sometime in July and I came out of the interview convinced that I would not be selected: I had fumbled in answering practically every question I was asked coming up with an incorrect statement to begin with modifying several times when the interviews probed me further on my answer. To my surprise I was selected. I learnt later that what impressed the committee was the fact that I was thinking on the spot and by successive modifications I got to the correct answer eventually.

How was your life in TIFR with some most memorable experiences?

The entrance interview was one of my most memorable experiences. Even while I was fumbling in my answers, I liked the questions they asked me. This was at the Old Yacht Club - the present Anushakthi Bhavan.

In my second year as a student, a visiting mathematician during his course of lectures had mentioned a result in passing which many of those attending his lectures were talking about in the corridors looking for a proof (I was not attending the lectures as my background was as yet inadequate to be able to follow them). I came up with a proof which spread around. A couple of days later M S Narasimhan came up to me and complimented me on my "nice" proof.

On an earlier occasion too I had found an elegant proof of a statement which had baffled others in the school. I was invited to speak in the International Colloquium on Differential Analysis in 1964 organized by TIFR. It was a great privilege and an honour: all the speakers other than me were well known figures: three of them were Fields Medalists at that time and three others were to get the prize within the next couple of years. K Chandrasekhran who headed the School of Mathematics insisted on rehearsing my talk in his presence and gave me useful tips on lecturing. Thanks to him, I delivered a lecture which was very well received.

In 1965 I received out of the blue an invitation from Professor J-L Koszul (a well-known mathematician who had visited TIFR in 1958) to visit the University of Grenoble for 3 months. It turned out that some work I had done was brought to the attention of Koszul by Raghavan Narasimhan and the result was the invitation. When I received the invitation I had no idea about Narasimhan's role in this.

An equally pleasant surprise was an invitation from the Institute for Advanced Study in Princeton to go there as a Visiting Member for a year (though I was now sure that Raghavan Narasimhan was behind this too). I was thrilled to see that the letter was signed by Robert Oppenheimer. And a year after my return to India from Princeton I was invited to Yale as a Visiting Professor, again a pleasant surprise (and this time Narasimhan had no role to play): work I had done in Princeton had attracted wide notice.

Just before I left for Princeton in August 1966, I had indications that I was to be promoted as Associate Professor. I was at once elated and nervous: I was not sure that my achievements were good enough to warrant such a response but told myself that the people who decided these things were better judges than myself. However, it did put considerable pressure on me to perform better than I had done till then. The letter appointing me as Associate Professor was sent to me at Princeton, the Princeton visit itself being treated as "deputation with salary".

Early in 1970, I received an invitation to give a "Sectional Talk" at the International Congress of Mathematicians to be held in August that year at Nice, France. Such invitations are regarded as highly prestigious in the mathematical community and I was naturally thrilled to get the invitation. In 1982, Professor Harish-Chandra wrote to me telling me that he wanted to nominate me to the Fellowship of the Royal Society and asked me to provide me some relevant information about myself. That Harish-Chandra thought so highly of me made me very happy. I later learnt that such stalwaarts and Robert Langlands, Michael Atiyah and Frank Adams were the supporters of my candidature making me even happier. However I did not get elected in the next seven years at the end of which my candidature lapsed. I was re-nominated in 1998 and was elected to the Royal Society in 2000.

Can you please share functioning of TIFR throughout your association with the institute?

I will first say a few words about the functioning of the School of Mathematics where I had a role in formulating policies as well as implementing them over a long period of time. The School did not introduce a formal graduate school till 1984 (the School of Physics had started its graduate school a decade earlier). Students were taken as "Research Assistants" and were on a 5 year contract on a pay scale and were members of the provident fund scheme. All academic appointments were also 3 or 5 year contracts. The "Faculty" consisted of Associate Professors and higher ranks and as they were the decision makers, they were de facto permanent members of the institute. On each promotion a new contract was given. Contracts were also renewed without a promotion. The functioning of the school underwent some drastic changes in 1987 - 88. The earlier policy under which academics could stagnate in a position indefinitely gave way to a more liberal promotion policy as a result of which every academic staff member with an average performance could rise steadily to the level of Full Professor even while good performance would be rewarded with accelerated promotion. The late eighties and early nineties were a period of considerable turmoil in the institute and occasioned policy changes some of which in my view were not conducive to the promotion of excellence. Till 1997, the School had total autonomy in all academic matters including recruitment of students and faculty and promotion at all levels. Even at the highest level where the appointments were supposed to be by invitation by the Council - Senior Faculty in the School made recommendations to the Council which were accepted routinely. In 1997, the then Director took on a direct role in promotions to higher levels, chairing the relevant committees. I am of the view that this was not a good step.

The academic performance of the Mathematics School has been uniformly excellent. There were fluctuations of course when the crests reached levels comparable to the best in the world, but even at the troughs (during the turbulent period of the late eighties and early nineties) the School would belong in the top 15 or 20 Schools the world over. There was an inevitable fall in standards of scholarship among the students, thanks to the pressure of completing a degree within a specified time period . On the other hand a structured graduate programme prevented the kind of aimless drift that some students went into in the earlier period.

As to the functioning of the Iinstitute as a whole, evidently on the national stage we have maintained a performance that has not been matched except perhaps now and then by IISc. But I am afraid that not all disciplines pursued at the Institute have done as well as the School of Mathematics at the international level, at least not as consistently as the Mathematics School. This is the impression I gathered talking to people in different areas of science both within and outside the Institute. The needs of different disciplines vary widely and with my expertise limited to Mathematics I am not in a position to analyze the reasons for this, much less suggest remedies.

There is one aspect of the organizational structure of the Institute over which I was not generally happy. Practically, all administrative and policy making powers are vested in a single individual - the Director - in the Institute. There is no formal mechanism that makes consultations with (even) Senior Faculty in taking far - reaching decisions obligatory and so participation of Senior Faculty in matters of policy as well as their implementation depends entirely on the Director's initiative. While with some of the Directors this worked reasonably well, with others Senior Faculty had virtually no role to play in the running of the Institute. I know for a fact that Senior members of the Mathematics Faculty have been consulted only very rarely about important matters affecting the Institute as a whole. There was to my knowledge one attempt to give a somewhat formal role to some senior faculty in the nineties, but it came to nought as the then Director was not willing to take it seriously; and the formal structure simply vanished during the term of his successor.

There is another issue which perhaps does not quite figure in the "functioning of the institute" in a technical sense. It seems to me that for an institution of the size and reputation of TIFR, the Governing Council ought to have more members from the Institute than just the Director. After all, TIFR can justly claim to have on its faculty some of the best scientists in the country in practically any discipline pursued at TIFR - and this has been indeed the case over the last 50 years and more. In such a context it seems to me that TIFR has lost out over the years for not involving such scientists in policy formulations (which is the prerogative of the Council).

I think that the Council should have two members from the TIFR faculty who are in schools other than the one to which the Director belongs as a scientist. Incidentally, the structures set up when the institute was founded made good sense at that time: the country had few scientists of eminence and Bhabha was acceptable as a visionary by the entire scientific community. But the situation has changed considerably, and continuing the model in which practically all the power and responsibility is vested with a single individual does not serve the cause of the institute very well.

TAA

What are your views on science education, research, innovation, management, policy and particularly on the future of research in Mathematics?

Prof. M.S.R

The future of scientific research in general depends on our ability to provide quality undergraduate education. There is some hope with the formation of IISERs that at least a limited number of students can get good exposure to science at the undergraduate level: they seem to have succeeded in recruiting good faculty (though the success in this is not uniform across disciplines, mathematics figuring at the lower end of the spectrum). But undergraduate education outside the IISERs, Chennai Mathematics Institute and ISI is not in good shape. If we really want to build a scientific community comparable to those in advanced nations, the kind of undergraduate education offered by the IISERs should be available in a very large number of colleges all over the country. And that can be achieved only if the teaching profession is lot more attractive than it is. Emoluments are a consideration of course, but it does not end there by any means. Working conditions have to be improved vastly.

TAA

What would be your advice and suggestions to the students, faculty and alumni of TIFR?

Prof. M.S.R

I think both faculty and students should be making efforts in promoting scholarship. I know that in the context of the students having to complete their degree in a limited time frame, this is not easy for them. But in the long run, if scholarship is not emphasized, the quality of the research will inevitably fall.

"The ultimate satisfaction that a teacher can derive is when you start learning from the students and they reach a stage in their career when students do better than their teachers!"

Prof. S. M. Chitre

Interview

Prof. Chitre is a distinguished TIFR Alumnus who joined TIFR in the year 1967. He is currently a Professor Emeritus at the Centre for Excellence in Basic Sciences, University of Mumbai. His primary research interests are Solar Physics, Physics & Astrophysics of Neutron Stars & Black Holes and Gravitational Lensing. Recently, he has been honored with the Padma Bhushan (2012).

Prof. Kumar Chitre visited TIFR on March 13th, 2012 and talked at length with the TAA Newsletter Editor, K P Singh (KP). Following is a summary of the conversation that took place.

KP **Welcome Prof. Chitre. First of all, on behalf of the TIFR Alumni Association (TAA) please accept our congratulations on being honoured with the prestigious National Award – Padma Bhushan, announced on the Republic Day this year. This is the second of a series of interviews that we are planning to conduct with distinguished alumni of TIFR, and which we plan to publish in our Newsletter that will be read by the TIFR alumni worldwide. I have a series of questions prepared for you by myself and Dr. Aravind Chinchure. So my first question to you is, can you briefly describe your journey so far including your childhood, early education, research etc.**

Prof. Chitre First of all, KP I should like to express my happiness with the work being done by the TIFR Alumni Association.

J. V.Narlikar, Sir Michael Atiyah, S.M.Chitre and M.S. Narsimhan

I am really a local product, born and bought up in a suburb of Mumbai. I had my primary education in Bandra before entering the Parle Tilak Vidyalaya and later King George English School for my secondary education. I then joined Elphinstone College/Royal Institute of Science, Bombay for a Bachelor of Arts course in Mathematics. During these undergraduate years I was exposed to a wide variety of subjects in Humanities such as English Literature, Sanskrit and Social Sciences. I recall that right from high school days I was greatly influenced by my Sanskrit teachers who introduced me to classics like Meghdoot, Swapnavasavadatta, Kadambari and even Panini's grammar. During my College days I was fortunate to be taught Mathematics by inspiring teachers like Professors P.R. Masani, Tongaonkar, Kamath, Mrs. Tendulkar among others, and English Literature by Prof. M.V. Rajadhyaksha and Mrs. Kamal Wood. My recollection from those days is of the Study Circle that Professor Masani ran very enthusiastically on alternate Saturdays during my first and intermediate years at Elphinstone College. He would assign us a topic in Mathematics and give background material to read. He would guide us how to structure a coherent seminar and then deliver it effectively with proper stresses and in an articulate manner by rehearsing the presentation in front of him the day before the Saturday Study Circle meeting.

KP

Tell us about your inspirations or the people who inspired you in your early days?

Prof. Chitre

My father impressed on me during my early school days that education was our passport to a rewarding professional career and he saw to it that my brother and I worked hard to achieve this goal by providing the best possible education available those days within his limited means. After my B.A., I was fortunate to win a scholarship of the Cambridge Society of Bombay which arranged for my admission to Peterhouse (St. Peter's College), Cambridge to read the Mathematical Tripos. These were the formative years of my life when I attended lectures by distinguished mathematicians and physicists like Dirac, Hoyle, Mott, Atiyah, Burkill, Lapwood, Batchelor and a host of other eminent scientists whose stimulating lecture-courses opened up a whole new vista for choosing my research area. I recollect in my Part III of the Mathematical Tripos, I had written an essay on "Why are Sunspots dark?" After the Tripos results were declared, we were called by Professor Hoyle to his home (from where he normally used to work) to discuss our doctoral programmes. He suggested that I should develop my essay on the darkness of sunspots into a thesis and that is how I got initiated into the area of Solar Physics.

I made a switch from Peterhouse (my undergraduate College) to Churchill College for my graduate studies and after completing my Ph.D. in 1963, I left Cambridge to take up a Lecturer's post at the University of Leeds. During my 3 year stay at Leeds, I had extensive discussions with Professor Cowling who greatly influenced me and shaped my future course of researches in Magneto-hydrodynamics and Solar Physics. At this stage of my professional career, I decided that we should return to India after gaining some research experience in the U.S. Professor Cowling suggested that I should spend some time with Professor S. Chandrasekhar at Chicago, but Chandrasekhar did not have adequate funds at that time to support me for a full academic year and recommended my name to Professor William A. Fowler to work at the California Institute of Technology (CalTech) and I landed in Pasadena for my first post-doctoral job in the U.S. with the backing of Cowling and Hoyle! The Caltech year was very stimulating and productive for me in the company of Kip Thorne who introduced me to Relativistic Astrophysics, in particular the structure of neutron stars. I also interacted with John Bahcall with whom I shared the excitement of the challenging "missing" solar neutrino problem. In 1967, my wife and I decided to return home to raise our first child in India and also to give back to the country what I had gained from the education that I had received in England.

KP

What challenges did you face early on?

Prof. Chitre

When I started attending courses, I realised that my earlier training in Mathematics was rather inadequate and it was quite a challenge to keep up with standards required for the Mathematical Tripos. Thus, for example, in the very first paper at Part II set by Professor H. Bondi, quite a few of us could barely manage to solve completely 3 questions out of 10!

KP

How about your experience of getting into TIFR?

Prof. Chitre

While in Pasadena, I came across Prof. S. Bhattacharajee of TIFR who was spending his sabbatical year at CalTech. I had long chats with him about my future plans and it was he who persuaded me to write to Professor M. G.K. Menon who had become Director of TIFR the previous year after the

untimely death of Dr. Homi Bhabha in a plane crash. I regret though having missed meeting Dr. Bhabha so narrowly. Sir John Cockcroft, Master of Churchill College where I spent 3 years (1960-1963) as a Research Student often used to talk about his friend, Homi!

KP

Would you like to describe life in TIFR with some most memorable experiences – professional or non-professional?

Prof. Chitre

I enjoyed the academic freedom that I had while working at TIFR and the experience of interacting with colleagues like Jayant Narlikar, Biswarup Banerjee, P. P. Divakaran, Krishna Apparao and others from various disciplines was immensely rewarding. We were encouraged to organize Conferences and Workshops for which we invited several experts like Jerry Ostriker, E.P.J. van den Heuvel, Peter Eggleton, and Geoffery Burbidge to deliver lectures. I recall an International conference that we had arranged in Cosmic Ray Astrophysics in which distinguished scientist like Fowler, Cameron, Parker, van de Hulst, McCrea, Rossi delivered lectures which had inspired many of us and our young colleagues.

I was fortunate in having some excellent graduate students while at TIFR which included Garde, Dilip Kale, Antia, Narasimha, and Kandaswamy. Antia, for example, was set on working in the area of classical hydrodynamics and eventually found his way into Solar Physics. Narasimha and Kandaswamy studied the phenomenon of Gravitational lensing when the multiple images of quasars, rings and arcs were just beginning to be detected and went on to design numerical models to reproduce the observed morphology of the lensed configurations. Kandaswamy later switched to the area of magnetohydrodyanamics to become an expert in the study of origin and maintenance of magnetic fields in the Universe.

KP

Would you like to say something about the functioning of TIFR during your stay in TIFR and whether it has changed recently based on your association directly or indirectly?

Prof. Chitre

I worked with Professor S.S. Jha when he was Dean of TIFR as his Assistant. It was a valuable experience, but I found the workload was too much and stepped down after a year. It is remarkable that the functioning of TIFR is such that one enjoyed considerable freedom. Thus, the Institute encouraged us to participate in outreach activities like setting up of the Nehru Planetarium, etc.

KP **Any advice and suggestions to the students of TIFR?**

Prof. Chitre I should urge students to make most of the opportunities available at TIFR and excel in their chosen field of research. Equally, TIFR Faculty should actively participate in giving lecture-courses, for only through teaching that you can attract students to work on your research programmers. I firmly believe that the ultimate satisfaction that a teacher can derive is when you start learning from the students and they reach a stage in their career when students do better than their teachers!

KP **Do you have any specific views on science education, research, innovation, management, policy etc. particularly your views on the future directions in your area of expertise.**

Prof. Chitre It is gratifying for me to note that the government is making massive investment in education. Basically this issue should be addressed at two levels- primary/secondary and college education. We must have widespread training programmes for teachers, since in my view; it is the body of teachers which determines the complexion of a teaching institution. I have no doubt the best teachers attract the most promising students whose career and choice of subjects are shaped by stimulating and challenging instruction in classrooms and laboratories. The high drop-out rate of students can only be arrested by monitoring and auditing the performance of teachers (e.g. attendance record, quality of instructions) through a network consisting of a nodal centre (e.g. HBCSE), several statewide hubs each linked to a large number of rural/non-urban schools. Of course, for such an enterprise (as envisaged by Dr. M.G. Deo) one will need huge complement of supervisors and inspectors and volunteers drawn from social service organizations and even from colleges.

KP **How about your involvement in the teaching of science and popularization of science within Mumbai and the country**

Prof. Chitre I cannot help feeling that while at TIFR I got involved in too many activities! But I enjoyed being part of the outreach and science popularization programmes such as Bombay Association for Science Education (BASE) which Prof. B. Venkataraman got me involved in and also the Homi Bhabha Fellowship Council which Mr. J.R.D Tata invited me to run. Likewise, after my retirement when I got

involved in teaching courses in Mumbai University's Physics Department, I was asked by the DAE in 2007 to set up a Centre for Basic Sciences (CBS) in the Kalina campus of Mumbai University. This was structured as a 5-year Integrated M.Sc course in various disciplines with students selected after their 12th standard, on the basis of a National Entrance Screening Test conducted at about 30 centres around the country. Indeed, I was very happy to be part of such an endeavour and with the help of Visiting Faculty drawn from TIFR, BARC, IITB, HBCSE … we were able to carry out the teaching programme and lab instruction. The first batch is about to graduate this year.

KP

Any suggestions for the Alumni?

Prof. Chitre

I am highly pleased with the way the TAA has done its job in a short span of just 11 years. I was immensely grateful for the enormous help I received from Arun Grover, Rajan, Madhu, Dr. Agarkar and others in organizing the first Conclave of Homi Bhabha Fellows in November 2009 at TIFR. This was held during Homi Bhabha Birth Centenary Celebrations and it was reportedly so successful that there were a large number of requests to hold such an event again. It is my earnest hope that TAA will be invited to engage in a major way in the activities related to the TIFR Endowments Fund by piloting massive fund raising campaigns through the Alumni network.

KP

Anything else that you would like to add by way of any interesting anecdotes?

Prof. Chitre

I had always hoped that Professor Stephen Hawking would sometime visit TIFR, which ultimately happened in the year 2000. He came to participate in an International Conference on Strings at the Institute and also delivered a Public Lecture in the city. The organizers of the conference had arranged a specially fitted van for his transportation and special ramps were constructed for an easy movement of his wheel chair. One day while we were out sightseeing with Stephen and his entourage of nurses, he suddenly expressed his desired to have tea in the Taj Mahal Hotel. I had just about Rs. 300 with me and there was no way we could have had tea in the Taj for the whole group with that amount of money. I recalled that one of the Directors of Tata Sons, Mr. Krishna Kumar had come to TIFR the previous week to see me and to express the displeasure of the Tatas that Stephen was being accommodated in the Oberoi. As soon as we arrived at the Taj, I phoned Krishna Kumar to tell him that we are now in one of its restaurants taking tea. He came promptly and laid on sumptuous hospitality by making one of their best suites available for Stephen and treating us to a delicious dinner in the TANJORE, where Mr. Ratan Tata showed up later in the evening to greet us.

"We need to educate millions of people in the next 10-15 years. Not everyone wants to do a Ph.D. But we need to enable millions of people to be educated. For that all of us have to play role."

Prof. R. Ramaswamy

Interview

Prof. R. Ramaswamy joined TIFR in 1981 in the Chemical Physics group, and in 1986 he moved to the Jawaharlal Nehru University as one of the first members of the School of Physical Sciences. Currently, he is the Vice-Chancellor of Central University, Hyderabad. His research has been at the interface of Chemistry and Physics, and in recent years, in Computational Biology. His main current interest is in the study of nonlinear dynamics, in the process of synchronization and control, and in the application of these ideas in systems of physical as well as biological interest.

Prof. Ram Ramaswamy (RR) was at TIFR on Feb 28th, 2012 to deliver a Public lecture to commemorate the National Science Day,2012. His lecture was entitled "Deterministic Chaos: The Middle Kingdom." The TAA News letter Editor, KP Singh (KP), met him after the lecture and interviewed him. The following is the transcription of the interview recorded on an iphone.

KP **Welcome Ram. This is the first interview that we are going to conduct with a distinguished alumnus of TIFR, and which we plan to publish in our Newsletter that will be read by the TIFR alumni worldwide. I have a series of questions prepared for you by myself and Dr. Aravind Chinchure, who is unable to be present here due to his previous engagement in Delhi. So my first question to you is, can you briefly describe your journey so far including your childhood, early education, research etc.**

Prof. RR Well KP, I went to many schools and finished up in a boarding school in Mussoorie which was not very academically oriented. I then decided to go to Madras University, to Loyola College actually, where I did B.Sc. in Chemistry. I chose to study Chemistry because I liked the subject very much, and then I went to IIT Kanpur and did my M.Sc. in Chemistry. After that, like most of my class, I went to USA to do Ph.D.

in Chemistry at Princeton University. Subsequently I went to CalTech on a post-doctoral assignment and discovered that I enjoyed Physics a little more and I started getting into, what in those days was, a young area, Dynamical Systems and Chaos Theory.

KP **Tell us about your inspirations or the people who inspired you in your early days?**

Prof. RR There were several inspirational teachers. At the undergraduate level, there was A V Ramaswamy who was a brilliant organic chemistry teacher. In IIT/ K there was the best Chemistry Department that one could have with teachers like P T Narsimhan and C N R Rao, and H S Mani in Physics. At the IIT all were very inspiring! My thesis advisor, Herschel Rabitz at Princeton, was a very young professor at that time, he is still very active. My post-doc supervisor Rudy Marcus was a role model and he won the Nobel Prize later, in 1992. Then I came to TIFR in 1981 and met people like Deepak and Mustansir. So lots of people have influenced me along the way.

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

Prof. RR Well as you know, I left TIFR in 1986, due to a complex set of reasons, but more because I had an opportunity in Delhi to start a Department of Physics. Moving out of very comfortable TIFR to a University (JNU) where most people did not know what Physics was, was quite challenging. The department was called Physical Sciences and half of the people used to confuse it with Physical Education (laughs!). Most of the time we had to explain that Physical Sciences meant Physics, Chemistry, Maths and not athletics and weight lifting!

KP **Really, in 1986!**

Prof. RR JNU in the seventies was completely dominated by Arts and Social Sciences. Even today if you go to JNU, most people think of it as an Arts University, not so much for science. In 1986, we started the Physics Department, the School of Physical Sciences, and about 3-4 years later we started a

M.Sc. Program in Physics. And I think that was one of the best things that we did. The challenge was to make it a good programme.

KP **So do you think that you succeeded in that?**

Prof. RR Look, KP, you have Shankar Ghosh who is a faculty member in TIFR today, and he was from the 3rd or 4th batch of MSc from JNU. Many of the post-docs that I see over here come from JNU. Many of your graduate students have come from JNU's M.Sc. program. Within 15 years or so, for any department to come in to certain recognition, I think is good.

KP **Any learning's and insights from your overall experience that will be useful to TIFR community and particularly to the youngsters?**

Prof. RR It is difficult to give advice. Your own experience is yours only. I can only say that what turned out to be very good for me was to be at TIFR for 5 years. I really had the freedom to change my life, the work that I did, the science that I did. I moved much more towards maths and physics from chemistry. It was also good for me to leave TIFR 25 years ago because I needed to be more in touch with younger students, and larger numbers of them. So that was very good thing for me. It is not the answer for everybody, but I certainly did not feel that I lost very much by moving to a place which clearly had less money and less privilege.

KP **How about your experience of getting into TIFR?**

Prof. RR I got back to the country from USA in 1980, and in 1981 I got an invitation to come and be a Visiting Fellow in the Chemical Physics group of TIFR. So I joined TIFR. A few years later I got the position of a Fellow. Those days, there were not too many places to work in the country, so it was really very nice that I was able to get a position here. Today, ofcourse, the opportunities are many many more.

KP **Would you like to describe life in TIFR with some most memorable experiences – professional or non-professional?**

Prof. RR So many memorable experiences during those 5 years that I spent over here. I had my son over here. I made many great friends here – Deepak, Rohini and several others who stayed on here, and have been friends since then. Those were very nice days. Bombay was not so crowded, India was different. Those were quieter times in general.

KP **Would you like to say something about the functioning of TIFR during your stay in TIFR and whether it has changed recently based on your association directly or indirectly?**

Prof. RR I have been coming back to TIFR, typically once or twice a year over the last 25 years or so. I have stayed close to my colleagues here. I think TIFR right now is in a very exciting phase because of the new campus that is coming at Hyderabad, and I am very excited because the way my life has evolved. I am in the adjacent campus. This is something I am really looking forward to, to see how TIFR will expand and how it will enter into some kind of closer interaction with the Hyderabad University.

KP **Any advice and suggestions to the students, faculty and alumni of TIFR? How the second campus should evolve?**

Prof. RR What I am hoping for is really that TIFR will discover that it has such an important role to play in this country. Most people – much of India has a great admiration for TIFR. They really feel that whatever TIFR has done in the areas of Mathematics, Nuclear Science, and Physics has brought us to world class research levels. In that sense, TIFR has a big role to play. By going to a bigger campus, by going next to a big University, I hope that this interaction with a larger community will increase, and that TIFR will be able to play a much bigger role in the intellectual life of the country. People still look to TIFR for training Mathematicians, Physicists, Chemists, Biologists. There is also so much need in the country that people would be looking to TIFR to provide place for them to study, to learn, and to get teachers from. So, all these are the roles that TIFR has to play. It has the responsibility to do this.

KP **As you know Homi Bhabha when he setup TIFR, this was one of his aims and desires. So do you think that this has happened sufficiently or not?**

Prof. RR Much more should happen in this direction. At the end of the day it is a personal choice whether you stay at TIFR or go some other place. But even staying at TIFR for a short time changes your outlook completely, and that privilege is needed for many people. Also many of the people that you train here need to go out to other places.

KP **Well, most of the students do go out, but not necessarily within the country, and particularly not to the universities. So do you think it is the conditions in the universities by and large that discourages people?**

Prof. RR It is a chicken and egg problem. If you don't go there you can't make them better. You can't wait for somebody else to make them better. I have been fortunate. Even though I moved out of TIFR to a university it was to JNU which is one of the best and most privileged universities in the country. Even then you do have to spend a lot of effort in making changes. You cannot count that effort in terms of the fact that you could have written five more papers.

KP **Do you think that TIFR is kind of crowded now, and it needs to expand just to keep up with all the current areas that people here are working on apart from expanding into new areas?**

Prof. RR In general, our longevity, both in science and otherwise is today more than what people had originally planned for. Today a lot of people retire at the age of 65 or more. To be in the same laboratory for 40 years or more, the models have to change. So if you have a new campus, I think, there is place for both. After all, the new campus is ten times as big as TIFR Mumbai. Even if you duplicate TIFR, you still have a chance in the extra space to do new things.

KP **As you know people here in TIFR have been evolving into different scientific areas, and taking up big new and challenging projects, but the number of people and space requirements have not kept pace.**

Prof. RR I agree. But now there should be no space problem at Hyderabad. People should do the science they want to do and as before the new scientific areas should be led by the people. This has always been the TIFR model, where people decided the scientific areas to work in and developments were not based on new subjects alone. That, I think was Homi Bhabha's greatness, and his vision was that science should be led by people. Honestly, I also realize the conflicts. The difficulty of doing completely new things in a completely new place is that there is too much that is new. You have people who have no experience, people who have no tradition, no knowledge of an institution; they cannot create the same new institution. So I would, if I had my way, do a mix of both the new and the traditional.

KP **Do you have any specific views on science education, research, innovation, management, policy etc., particularly your views on the future directions in your area of expertise.**

Prof. RR My focus now is taking care of a University. There is a huge challenge that is confronting us. How to ensure growth in the intellectual capital of the country and include people at large in this process? By include, I specifically mean bringing marginal groups that have not had education, or access to education. How to bring them in to the sphere of higher education? The numbers are mind boggling. We need to educate millions of people in the next 10-15 years. Not every one wants to do a Ph.D. But we need to enable millions of people to be educated. For that all of us have to play role. India is going to need a very large number of teachers, researchers, and mentors. I think I would like to see our top class institutions play a leadership role in this. Because if you don't, the vacuum that is there means that somebody else will step in. And when you can provide great quality, for example from TIFR, I think it is almost a duty.

KP **That's about the higher education (after 10+2). What do you think about the primary education, which I personally feel is more neglected in the country, and which is essential to prepare the children for the higher education?**

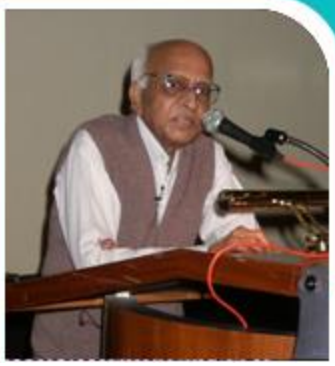
Prof. RR Well, the way I see is that even to teach the teachers at all levels, you need good higher education, and that is where we can do the maximum. We are not doing enough, for example, to make good teachers after they have done their B.Sc. We are not taking enough special efforts to create a large number of good teachers in Maths and Science for the schools. People from institutions like TIFR should go out to the universities and create bench marks for producing good quality teachers. And the universities can then become the training grounds for the next generation of teachers.

KP **Anything else that you would like to add ? Any jokes or anecdotes?**

Prof. RR Well, not really. I am glad that Deepak while introducing me to the audience today did not tell too much about my craziness when I was here. I actually think the idea of Alumni Association is a very good one and I am trying to replicate this at the University of Hyderabad. I have told them to bring in every one who has been here – including Teachers, Vice-Chancellors- in to the Alumni Association. I am using this to increase the sense of belonging, raising awareness, raising funds etc.

"Some of us thought that we should apply the knowledge and methodology of learning and teaching to the conditions here (India), to the people here, to the students here, to the teachers here."

Prof. B. M. Udgaonkar



Interview

Prof. Udgaonkar joined TIFR in 1949 as a research student with Dr. Homi Bhabha. He took charge of the Theoretical Physics Group in the year 1963, which soon acquired an international reputation. He is also responsible for initiating Graduate Courses and the Visiting Students Research Programme in the School of Physics. Homi Bhabha Center for Science Education (HBCSE) at TIFR was emerged out of his initiatives. He has written extensively on science education, role of technology in development, international scientific cooperation and global nuclear disarmament etc.

Here are the excerpts of the interview with Prof. Udgaonkar conducted on 27th and 28th of April, 2012 by Dr. Jayashree Ramadas, Director, HBCSE (Homi Bhabha Centre for Science Education, Mumbai), and Mr. Senthil Babu and Kumar Arunachal of HBCSE.

TAA **Can you illuminate us as to the details of your journey so far including your childhood, early education, research etc?**

Prof. B.M.U My life has been lived throughout in Bombay. In the beginning, I was schooled in the municipal school system up to Class 4, which was near King Circle area where we lived. Matunga-Dadar area was the centre of Bombay in those times from 1920-25. Though it was a municipal school, which would frowned upon these days was not the case with us. We had good teachers. They used to tell long stories. It was a good way to learn language at that level, how to speak well and so on.

Then we shifted to the Hindu Colony area. The natural place to go for further study after Class 4 was King George School. It turned out to be quite good. There were many good teachers and we liked the atmosphere. All the teachers were Indian. This was 1934-35. They opened a post-primary branch. There was a temptation

to join and save one year, moving from Class 4 to 6, taking their course during vacations. But I soon got over that temptation because it was difficult. I had not done any English up to Class 4 and to skip one year one had to know simple English which can be quite difficult to master in short time. The class eventually I joined was Ingreji Pehili.

This went on till 1943, when I appeared for the matriculation exam conducted by Bombay University and not by a board. Bombay University conducted the school level examination from Karachi to Dharwad. Only 27000 students appeared for the exam, this number is small compared with the corresponding data for different zones of Maharashtra state alone. When the school system expanded, the government created a board and later multiple boards came into existence. Taking the cue from this, I had proposed similar system for college education where Mumbai University could be divided into different boards each giving a degree of its own. However, this hasn't been taken up seriously. So, carrying on with the education path I took, I happened to secure 1st position in Mumbai and 2nd in Maharashtra, although the focus was never on securing a rank. I joined Elphinstone College, then the best college. It was in the downtown Fort area near the museum. I was living in Matunga. It meant 45 minutes travel each way. My parents decided that it was better than joining some other good colleges that were opening up around the place we lived. I think Ruia College had just opened then. I used to come to Churchgate station and walk from there. I did my Higher Secondary in 1945.

In those days, we had long continuous vacations after the 1st year in colleges. The children were left to themselves with no guidance as to what they should do during the vacations. I got into the habit of going to the University library every day and look for good books to study. I would go to author index or the subject index to find books. I found biographies of scientists which included the life of Einstein, James Jeans, Eddington, although the last two were heavy for me at that stage. Chemistry was a more straightforward thing to my mind at that time, involving properties of substances, methods of preparation etc., but I couldn't find any good chemistry book that could have enthused me at that stage. I particularly remember a book called New Physics. I forget the name of the author. It was fascinating and struck me. It had details on the new and latest thinking in Science.

In the meantime, 1948, my parents both died and I had five younger siblings dependent on me. That, however, did not deter me from my growing idea that I would take up science and go for research. The influence of what is available and what is not is often important. When I was thinking of doing Science, I had to see where I could do it. I had five younger brothers and sisters to take care of, which essentially meant I had to live in a place suitably close. I could have gone elsewhere had there been a scholarship but they were not

plentiful in those days. So I continued in Bombay and did B. Sc. from the Royal Institute of Science. Later they removed the "Royal" from the name. Incidentally, that was just the time when TIFR was started in Bangalore (and later moved to Bombay in 1949). A few people suggested pursuing for the IAS and joining Imperial Bank (now the State Bank). I appeared for the competitive exam of Imperial Bank. I bought the forms for IAS exam but didn't appear.

TAA

Who were the people who inspired you to reach the highest position?

Prof. B.M.U

Not all teachers are ever found to be good at any given place. One third of the teachers are good, probably this is the universal experience. Also, not all teachers are required to be good. Just a few good teachers are enough to give you an idea of what good teaching means. I have earlier remarked about the good teachers who were there in the municipal school and then at King George School. I remember a few good and inspiring teachers from the time I was at the post-primary section of King George School. One of them was Mr. U. Bhatt, a teacher of Mathematics. I think he was a Mangalorean. He was very good and made us to solve a lot of problems and referred to other books where such problems were to be found. Then, the Sanskrit teacher, Mr. Bembalkar, was very good. I started my first project with him although I forget the topic it dealt with. He told me not to come to his class as he thought I knew what he was teaching. No other teacher told me that. He arranged to teach me separately and we read classics like Kadambari. From him, I imbibed the lesson that one need not confine oneself just to textbooks. Another teacher gave some out-of-curriculum English books to read. As a result, I have never thought that reading books outside the curriculum is inimical in any way to your exams. I wonder what would be the present day children's attitude towards knowledge outside the curriculum.

I can't remember any single person who triggered my interest to take up Science. Same teacher taught us both Maths and Science. Coming to the time when I was in Royal Institute of Science, there were some good teachers in Maths. In Physics, there was one professor who used to take interest in me and there was Prof. Davar, a Parsee teacher, who taught the subject at Junior B.Sc. level. He encouraged delving into deeper and more advanced physics. Again I remember Prof. Dikshit, a very good teacher who taught higher levels.

TAA **What challenges did you have to face during your journey and how did you overcome them?**

Prof. B.M.U One challenge was the family situation of course. My father was a well-known social worker and founder of Shraddhanand Mahilashram for destitute children and women. After his death, a few people came forward and collected some money for us. I was 18 years old then and the youngest sibling was 2 or 3 years old. My mother, not wanting to outlive my father, in the Sati tradition, committed herself to fire within 24 hours of my father's death. There was some money left by my father, a monthly supplement of Rs. 100 from his trustee friends along with some money I earned from two tuitions, saw us through during those times.

That was a time when my siblings needed an older person around and I had to be there for them. They all studied up to their full potential. I had to take care of family responsibilities for a considerably long period till they got on their feet. This aspect of family responsibilities is probably becoming less and less common. Also the scholarships have to be more substantial, maybe even up to the mark to take care of the parents.

TAA **We would love to hear from you, your experience of joining TIFR and life there.**

Prof. B.M.U At the time of completing my M. Sc., the rush for a foreign degree had not started, although a couple of my classmates did go to USA for M. Sc. and Ph.D. One of my friends went abroad for higher studies suggested to me that I should also apply. Even before I completed my M. Sc., I had convinced myself that I will not be missing much if I do not go abroad. I sought an appointment with Dr. Homi Bhabha. I asked him what I should be doing. He said I could do research here itself. There was no reason to go out at this stage. He asked me to complete my M. Sc., and send my CV to Institute. He didn't assure me of admission. He encouraged me to continue my interest in research in India. It was a great thing for me. I joined TIFR in November, 1949, in contrast to other students who joined in August as I was working as a Lecturer in Siddhartha College and didn't want to leave the students half way. I waited till college authorities found a substitute.

TAA **Can you share your memorable experience while working in TIFR?**

Prof. B.M.U

I am bad at remembering things. One important notion we cultivated during those times was that, it would add value to our profile as a research institution to have our members working in the area of school education. Ordinarily, an institution like TIFR, even in those early days, would not come down from its ivory towers. What Anil Sadgopal, V. G. Kulkarni, myself and others were thinking of doing required descending from those ivory towers.

Anil Sadgopal was spending some time in TIFR. He had done his Ph. D. at Caltech. He was not interested in continuing a usual approach to a career where you do your Ph. D. and go on studying one problem after another and publish. He was interested in seeing how our learning at Ph. D. level could be applied in solving problems in India. I was also motivated with similar thoughts. I had just come back from USA in 1963-64. Some of us thought that we should apply the knowledge and methodology of learning and teaching to the conditions here, to the people here, to the students here, to the teachers here. This required studying how students are learning, how they are being taught, what methods are being adopted by the teachers and where these methods need to be changed. So, you go to the fundamentals, not in the theoretical sense, but required to keep your eyes and mind open to what is happening and then try to see where changes are needed.

It all started with Mr. Pitre, a senior teacher of Doon School. He had taken a project, sponsored by Education ministry on reorienting the teachers. Now they had a program to reorient some teachers from the Bombay Municipal Schools in which they tried to draw in some people from the TIFR. Yash Pal, V. G. Kulkarni were the people who took part. I also took note of what was happening, what they were suggesting and so on. It appeared to be a good program, orienting the teachers to think for themselves by what they called Discovery Approach. Some of these expressions have become quite common nowadays but one has to see - what was the method of teaching in schools about fifty years ago and how they were trying to change it. The crux of it was that you do not tell the students what you are going to prove but rather you do an experiment in order to find out what happens in nature. Towards this end, Mr. Pitre and his colleague were trying to develop a methodology of working with the teachers. Professor Yash Pal, V. G. Kulkarni, Rama and a few others in TIFR observed what was happening, and sometimes took part in the discussion and tried to see what it means for

them. It was quite interesting to look at teaching/learning process in a different way, in contrast to the old way where the learning child has a passive role. There was a batch of municipal school teachers with whom they would see and try to evolve a methodology. Now they needed more colleagues to help them. Ministry of Education had a unit called NCSE, National Council for Science Education, and they provided the money. It was one of the so many umbrellas under which funds were available from the Ministry. Eventually, it was decided to take another batch of teachers and students for the second year of the running of the program. Now here was the problem. It was supposed to be a month long program following vacation. But unless the money for the teachers for the program was guaranteed for the summer school, you cannot start. One could neither get the resource persons nor the teachers who are to be oriented. The issue with the capital was that there was silence from Delhi. At that stage Yash Pal wrote to the Minister of Education. I also wrote to him, urging that the program was good and should not suffer because of some bureaucratic hurdle. Whatever was the hurdle, it was removed and the second batch started. I suggested to TIFR that the program is good and if some of us have to spare time thinking about the program, then we should not depend on any authority outside of the institute, so that once you plan, you can carry it out without any problem.

My idea was that manpower and the resource persons have to come from TIFR and the teachers to be oriented come from the neighboring Bombay schools, and take the entire responsibility by TIFR. I discussed with our Director that we must have a small unit in TIFR, consisting of few people, who should be thinking about these problems and not be subject to the whims of the decision making people at Delhi. At that stage, I wrote to the education minister, Nurul Hassan informing him about our concerns and requested him to make available to us a grant of 1-2 lakh rupees per year. Kulkarni prepared a proposal on what one would have wanted to do if we have an Education Cell at TIFR and I took it to the Minister when I went to Delhi. After making a few minor corrections, he finally said yes to our intentions of starting from the very next academic year. But the beginning of academic year came and went without any communication from the Ministry. On sending a reminder to the Minister, somebody of the designation of Joint Secretary wrote to us saying that they didn't find the proposal. So I replied saying, well, there's another copy of it, do act on it. But nothing really was happening.

Anil Sadgopal and a few others including myself were attracted towards working in education. We used to meet together and talk over these things. Our idea was to do something with the local municipal school system, to see to it that students who go to these schools are taught in a different way and become better equipped by the time they leave the school. Anil on the other hand was thinking about starting something out of Bombay but required getting some grants from some other sources.

Dorabji Tata Trust contacted us. Kulkarni, V.S. Rao, Venkatraman, I and three four other people who were involved in different aspects of school education, called BASE (Bombay Association of School Education) went to meet the people from the Trust. We had a long and open discussion and they thought that our program was worth supporting with a promise that they will give us 15 lakh rupees for five years. Though Tata trust did not make a commitment beyond five years, our commitment actually lasted longer. In June-July 1974, Homi Bhabha Centre for Science Education was inaugurated.

This experience with School Education was something quite memorable in TIFR.

TAA **What would you comment on the functioning of TIFR during your stay?**

Prof. B.M.U On the present state of things, I would say that one can never be happy but one should not be unhappy either. Things move very slowly. Many a times, you perceive a certain change in the system but for others it is not so much of a change. It happens very slowly.

TAA **What are your suggestions to us on how to leverage a strong Alumni community?**

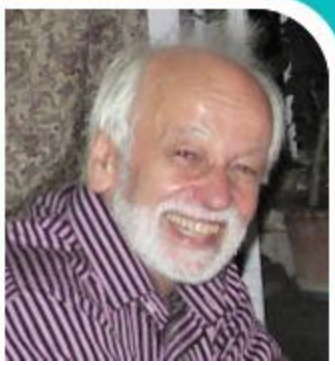
Prof. B.M.U Mr. Brij Arora has retired and still spends some days of the week at IITB. He has become the President of the Alumni Association recently and he is trying to see what can be done to mobilize the association.

I do not know whether there is any write up about the present activities of the Association. For example, medals which are given by TIFR to the students for the best thesis in Physics, Chemistry and Biology, which started in a small way when I gave some grant to TIFR some 30 years ago when my daughter was a research scholar and died prematurely.

I have not been following the recent activities. It would be useful to have a list of things Alumni association has been able to do. As for the newsletter, it is good idea to make it more substantive and further propose to include some articles, memoirs etc.

"My advice to students is, not getting too much focused on refining existing knowledge but rather thinking of viable investigations that have never been done."

Prof. G.H. Doehler



Interview

Professor Gottfried H. Doehler obtained his Ph.D. at the Technical University of Munich in 1968 in Theoretical Physics. He has held many positions in different institutions including the Max Planck Institut Fuer Festkoerper Forschung at Stuttgart as a staff member (1971-1983) and the Chair Professor of Semiconductor Physics at the University of Erlangen-Nuremburg since 1986. He has also been on sabbaticals at IBM (N.Y), Hewlett-Packard Labs (Palo Alto) and Tata Institute of Fundamental Research (India). His recent research areas include high field transport in semiconductors, THz generation and detection, transport in disordered systems and Organic semiconductors. Professor Doehler is the inventor of the NIPI super-lattice and was a recipient of the Schottky prize in recognition of this work. He was also the recipient of the Sarojini Damodaran Fellowship Award in 2005-06 and of a "Chair of Excellence" -grant from the University Carlos III of Madrid (Spain) in 2011-12.

Professor Gottfried H. Doehler was visiting TIFR recently and he was interviewed on April 18th by K.L. Narasimhan, Ashish Arora, Kailash Rustagi and K.P. Singh on behalf of TAA.

TAA **Thank you for giving us an opportunity to talk to us for the TAA newsletter. To start with it, it would be nice if you could tell us how you got interested in Physics**

Prof. Doehler My getting into Physics was unplanned. My best friend was two years older than me and he was very excited about Physics. This was my introduction to Physics. Physics comes in different shades. In some fields you are a small stone in a mosaic. In others you have more visibility. I decided Condensed Matter Physics suited my temperament best. I was interested in theoretical ideas but I was very curious as to what experiments I could do. Later in life, theorists thought of me as a reasonably good experimentalist and the experimentalists thought of me as a reasonably good theorist. Luckily, I ended up not

sitting between two chairs, but on both. After my Ph.D., I went to IBM at Yorktown Heights (USA) as a post doc. This was kind of standard at that time in Germany if one wanted to be considered later for a faculty. IBM was a very diverse place – very much like TIFR. My host knew many people at IBM and introduced me to many of them. It was a wonderful experience. From IBM, I returned to the Max Planck Institute in Stuttgart where I had earlier invented the n-i-p-i super-lattice and then continued to work on them in collaboration with experimental groups. From Max Planck I went on a sabbatical to HP in Palo Alto. HP was very different from IBM. It was an industrial lab with emphasis on future products. HP was interested in my work on the n-i-p-i structures. After a year, I extended my stay as HP was interested in making me an offer for a permanent position. HP told me that I would have freedom to also pursue my interests with the n-i-p-i structures. I realized that HP had a lot of equipment but I would get limited manpower support for pursuing my interest in the n-i-p-i. In the meantime, I also got an offer from the University of Erlangen. In contrast, there would be many students at the university but getting money for equipment would not be that easy. After weighing the odds, I decided to accept the offer from the University of Erlangen. I never regretted this decision; since it turned out that I had really much fun there with a strong group of students.

TAA

Wasn't it at this time that you got the prestigious Schotthy prize for the n-i-p-i structures?

Prof. Doehler

Yes. Actually, the Schottky prize is thought to be awarded to young scientists. In my case, however, there was a problem: The realization of n-i-p-i superlattices required advanced material growth technology by molecular beam epitaxy which just came up at the horizon when I conceived them. So, quite a few years elapsed before, finally, the concept could be verified by experiments. Fortunately for me, the prize committee recognized this and honored me for having developed the concept when I was still really a young scientist.

TAA

How did you get interested in THz generation?

Prof. Doehler

This was a natural extension of my work in studying high field effects in n-i-p-i. I realized that at high fields the transit times of ballistic electrons are just right for THz frequency.

TAA

Tell us how you first came to India?

Prof. Doehler

Kailash and I knew each other very well as our stay overlapped at Max Planck. In the seventies, before Kailash decided to return to India, he told me that I should come and visit. He mentioned that institutes in India welcome visitors and that these visits to some extent could compensate for the isolation of scientists in India. The first opportunity came in 1979 when I went to a conference on the east coast in the US and then to Japan. So I decided to take up Kailash's offer and came to India. This was my first trip and quite memorable. He picked me up at midnight at the airport and I stayed in his home. The next morning when I got up, the view from Kailash's balcony was like that in the UK but with palm trees. The architecture of the buildings – which I learnt later were the High Court and the University – was Victorian and very beautiful. On Kailash's suggestion, I visited first BARC and then came to TIFR and talked about our work on NIPI structures. TIFR was a very unusual place – it had a wonderful setting and beautiful paintings inside, which is uncommon in most science institutes – Homi Bhabha really had an eye for art work. I recall Walter Harrison visiting that day, giving a talk and was leaving to catch a flight – just before my talk. I was to leave one day later – but my stay got extended by a week. Just a few hours before I was due to leave for the airport, there was a major fire at the airport and all the flights were canceled for an unlimited period of time. After one week, finally, Kailash managed to get a ticket to New Delhi by Rajdhani in the foreign tourist quota and a connecting flight to Germany. Communication was very difficult at that time and it was not possible to call home and let my wife, Karin, know that I was going to be delayed. I sent her a telegram "Airport burned down, will return later." Although I was very much looking forward to see again my wife and the children after traveling for four weeks, this additional time gave me a chance to know India better … and to fall in love with India. During the following years I had several opportunities to visit TIFR – again by invitation of Kailash. In 2001 I had been invited to Delhi for IWPSD,

Prof. Arora helping with returning stuff to the Guest House

Prof. Arora and Prof. Narasimhan at his flat

and Kailash suggested that I come to TIFR for a one-day visit before returning to Germany. During tea, Brij and KLN suggested that I explore the possibility of spending part of my forthcoming sabbatical at TIFR. In the discussions, which followed, I noticed a lot of overlap with Brij in III-Vs, with Vengurlekar on sub-ps measurements (coinciding with my recent interest in THz) and KLN on organics – a field that I had started getting interested in. In fact, I could not think of a better place and so came in 2002 for 3 months. At that time, I did not yet realize that this was to be only the first of such visits and this year is the tenth visit since 2002. – Actually, we accumulated more and more belongings at TIFR which we stored with my colleagues' flats during the interim periods (see Pictures).

KLN

I must share with you that the two talks you gave actually had me thinking. After listening to your talk on the n-i-p-is, I thought that it would be fun to make an a-Si:H n-i-p-i superlattice – but wasn't sure how to do it. When I went on a study leave to Chicago, I shared this with Fritzsche who was very excited. We then experimented as to how to make this structure. I spent a year making a machine with a rotating sample holder sandwiched between two chambers to make the n-i-p-i superlattice. We quickly realized that the phase coherence length should be larger than the superlattice period and this turned out to be impossible to make. It was a lot of fun, though. On your second visit, you talked to us about a new result that you heard at a conference viz. the postulate by Spear of the temperature dependence of the mobility edge to explain the Meyer- Neldel rule. Based on your talk, we designed an experiment to measure the temperature dependence of the mobility edge and showed that there was no temperature dependence of the mobility edge per se. After a lot of correspondence, Spear accepted our results and withdrew this idea.

TAA

You have worked in many countries. Is there a national style of research? What is your take on how things have changed in India over the last ten years?

Prof. Doehler

My first detailed exposure to Indian Science was at TIFR and their Physics was international. Apart from that I can only speak about semiconductors and optoelectronics, as the conferences I attended in India were related to these areas. When I first went to the IWPSD-2001 (International Workshop on Physics of Semiconductor Devices) I noticed a quite pronounced Indian touch in physics presented there. I found many people were fascinated by their own ideas – but often their ideas didn't appear realistic or contemporary. Regarding the topics, research, in many cases, was dominated by the problems that perhaps the advisor had done for his thesis. There appeared to exist also very little contact with

researchers elsewhere, at the national or at the international level. Certainly, this was also compounded by the lack of resources, particular in equipment- so research was carried out on topics related to available equipment and materials without any special relevance. Today it is amazing how things have changed. I can rather objectively judge as I have attended nearly all the later IWPSDs during more than a decade. Research nowadays is much more contemporary and closer to international standards. People have more access to equipment. There is also a lot of discussion in the conferences which was missing earlier. Earlier, the opening session would be well attended and then would decay rapidly. Nowadays the ubiquitous and anthropogenic degradation of attendance and interest after a few days of conference in India no longer exceeds international standards.

One of the strengths I realize in India is the generally high level of theoretical understanding. Apparently, students are better trained in Theoretical Physics than in many parts of the world – including Germany and USA. Students elsewhere often have only peripheral understanding of the theory. Also the breadth of knowledge is wider amongst students here. As regards styles, in USA, students think very much as to what would set them apart from everyone else and could contribute to pave the way for a career or, at least for finding a niche. This appears to me quite typical for Americans, but, at the same time, quite important.

Any comments regarding what you see at TIFR?

Things have changed a lot here, too. There is a lots of new equipment, new Clean Room and an increased emphasis on nano sciences. You have had one MOCVD quite early and now you have another one, a state-of-the-art MOCVD for nitrides. I was always impressed by the students I interacted with. I was very close to Biswajit and enjoyed discussing new ideas with him even now while he is in Italy. I also enjoyed my discussions with Jayeetaa and Debu – who are both in Dresden now – and also the current batch of students. They all have a high level of theoretical preparation and a wide variety of experimental skills.
When Arnab was in Germany as a Humboldt fellow in 2002, he was working with a professor in Berlin who is now retired. I introduced him to his successor (Prof. Kneissel), who happens to be one of my former Ph.D.-students. It turned out that he has even more overlap with Arnab's interests, which are ranging from fundamentals to technological and industrial challenges.

TAA **Any suggestions for students?**

Prof. Doehler What should one do to be successful and to have fun at the same time? I am probably not suitable as an example to be followed. I never focused my interests on career planning. But still I was lucky. Most things just happened. I admit, when I started forty years ago, Physics was much easier. You could do nice new things based on scientifically rather simple ideas and still end up even with application relevant results. Of course, they were already quite challenging from a technological point of view. Quantum well lasers, for instance, have become standard in the meantime, but their fundamentals were just among the hot topics in semiconductor physics at the time when I started.

Today it has certainly become more difficult to come up with new ideas. Progress takes place on a more sophisticated level, but yet there is no lack of fascinating topics. My advice to students is, not getting too much focused on refining existing knowledge but rather thinking of viable investigations that have never been done. A good example, close to my experience, is the study of single quantum dots. During more than a decade they have continued providing a huge amount of new insights, including a deeper understanding of quantum mechanics, providing, for instance, text book examples for entangled states or coherent processes. It is amazing to see that at each conference in the field of nanostructures, whether dealing with quantum dots, spintronics or graphene, really novel results or novel ideas for future experiments are being reported. Therefore, I think it is very important and inspiring, also for Ph.D. students, to attend, if possible, international conferences – it has a huge impact. Even if you understand only a small fraction of what is going on, you get a glance of what is making a difference. You see, I am coming back to the "American approach", mentioned above! Causing me some trouble is a certain discrepancy between the extremely high expectations related to future applications of nowadays hot topics like quantum dots, nano-wires, carbon nano tubes, graphene and the huge challenges to be met, say, for the realization of spintronic ICs or quantum computers. Are those concepts too esoteric? – Perhaps, by getting older I am just partially losing my juvenile optimism! – I also notice that in India the job situation in sciences has changed. More and more young scientists are getting well-paid positions in industry, which is wonderful. But, even if you consider such a position, my advice would be to go first for a Ph.D. plus a couple of postdoc years abroad. I believe this will strongly enhance your creativity and the flexibility of your mind. And this will be required not only to be successful in academia but in industry as well.

TAA

Why is THz important?

Prof. Doehler

THz is challenging. Imaging is a driving force for THz. Unlike short wavelengths like X-ray, THz is not an ionizing radiation and one can also see through clothing with it. Good for scanning and looking for concealed items like weapons. Many molecular signatures in vibrational and rotational spectra are in THz. Thus, THz is also useful for analysis.

TAA

What are your views on the role of teaching in research?

Prof. Doehler

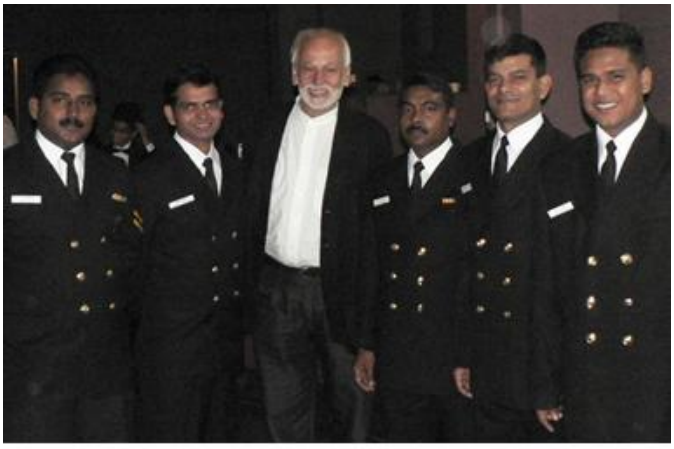
Teaching in Germany tends to be neglected as most professors strongly focus on research. Recently the German government has emphasized teaching in university. When I was a student, teaching was not particularly good.

TAA

What do you think are the new research areas?

Prof. Doehler

Nano science, spintronics, modern optics, all these fields are in vogue. These are the areas which come first into my mind, as I am familiar with them. Beyond my own fields there others, like bio-physics which are absolutely fascinating. If I was 50 years younger I might even consider going for that.



After concert with my friends from Indian Navy

TAA **Is there a special incident that you would like to share with us?**

Prof. Doehler Margaret introduced us to some members of the Bombay Chamber Orchestra. This made it possible for us to be part of the orchestra. Both Karin and I enjoyed the public performances we participated in with the Bombay Chamber Orchestra. Before the concerts there were rehearsals at NCPA, typically from 6:30 to 8:00 a.m. Initially it was a problem to be there carrying the instruments – Karin played the cello and I played the violin. It turned out that there were many performers from the Indian Navy in the orchestra. There was a navy truck which ferried them with their instruments for the rehearsal. When they found we were neighbours, they arranged for going with them in the morning and also for being dropped off at Navy Nagar. This way we got the unusual experience of riding in an Indian-Navy truck *(See Pictures).*

Debarking the Navy Truck with violin

At Samrat 2006

Attempt of becoming an Indian

With Karin at Khyber Restaurant

ALUMNI ENTREPRENEURS

Dr. Basant Rajan

Mr. Darshan Maharana

Dr. Subir Saha

Mr. Sandeep Saxena

ALUMNI ENTREPRENEURS

Dr. Basant Rajan

Tata Institute of Fundamental Research
Ph.D in Computer Science 1991 – 1997
basant.rajan@coriolis.co.in

Basant has over 20 years of industry experience. He was the CTO of Symantec India and headed the SRL (Symantec Research Labs) for 3 years, where he was responsible for sustaining and fostering innovation across 2500 engineers. He holds a number of patents in the storage domain.

Basant was instrumental in starting Coriolis Technologies – a services company with product ambitions. His team crafted virtualization management suite especially tailored for technical colleges and fund our endeavour helping clients, mostly early stage startups, to rapidly prototype, elaborate and productize their core ideas in niche areas like storage management.

colama

While sharing his experience, Basant said;

The motivation for Colama, our product offering, comes from our belief that real learning comes from doing as opposed to simply watching. We felt that web based learning, while it offered unprecedented scaling, fell short in providing an immersive learning experience because the lab was missing. Having had exposure to a variety of relevant technologies in our industry lives, we decided to bring to bear some of these to solve the problem at hand. Colama, the world's first system that unifies content and platform delivery, was the result.

Building a solution was the easy part. Driving adoption of new technologies in the field of education, that traditionally is rather sluggish, to put it euphemistically, remains. Our hopes are buoyed by the fact that a few marquee customers have already adopted Colama and are happy campers.

Interestingly, we've been collaborating with TIFR on the development of the product and have jointly filed a patent protecting the key IP involved.

Visit : www.coriolis.co.in/ http://colama.net/

ALUMNI ENTREPRENEURS

Mr. Darshan Maharana

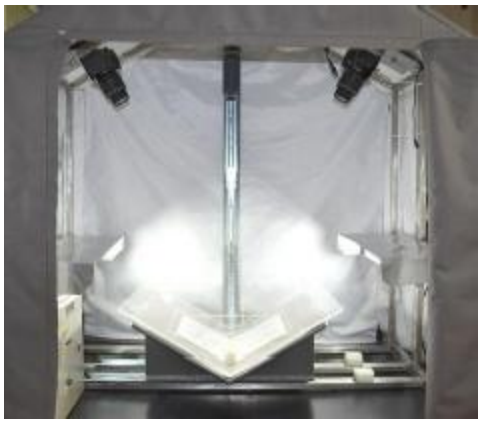
darshan@webgenic.com
darshanmaharana@gmail.com

Darshan worked at TIFR in high resolution NMR spectroscopy at National Facility for High Field NMR from 1986-1992. After his tenure at TIFR, he was working in the IT industry for over 19 years including 10+ years in the US software industry. He has expertise in designing and implementing complex, multi-tiered, multi-platform software and strong background in server side technologies including databases, e-commerce, web solutions, wireless access, message switching and client/server systems. He has worked for leading technology organizations such as IBM, Informix and other companies at their worldwide locations including US, Canada, Spain, Denmark, Thailand and India.

Darshan founded Webgenic Technology Solutions (located at Pune, Maharashtra) in 2007. His current product focus is digital publishing including online self-publishing platform at webgenic.com, enterprise solutions for mass digitization of legacy print content, e-library and more.

On the launch of his recent new product, Darshan said;

As a part of our Webgenic Digital Publishing Solution, we are excited to introduce a high-speed scanner for non-destructive, mass digitization of books and documents. Our product is called ScanCraft and is the first such scanner designed, developed and manufactured in India. Scanner Software is easy to use and has built-in features such as auto-scan, and editing scanned pages to crop, align and more. The scanning solution comes bundled with advanced e-library server software for managing digitized books. A govt of India organization plans to use it to scan a very large number of precious historical books and documents to make their digital versions available online.



Visit : https://www.webgenic.com/ for more information

ALUMNI ENTREPRENEURS

Dr. Subir Saha

drsubirsaha@yahoo.com

Yottolabs (Yotto Labs Pvt. Ltd) is founded by **Dr. Subir Saha** to create innovative software product in 2010. Dr. Saha is TIFR Alumni who was part of condensed matter physics group as a visiting fellow. He has more than 15 years of experiences in telecom majors like Motorola, Nokia Siemens Network, Alcatel, BT etc. Yottolabs is Bangalore based and is invested by its founders at this point. He is a prolific inventor with 25 patent filed and 5 issued patents to his credit.

After experimenting with VAS and Facebook applications for the B2C segment, we have created Stewot – The Digital Interactive Menu System to "Bring the Chef at Every Table". Stewot is the future of Dining. Stewot is cloud hosted with a brilliant visual UI over Android based tablet interface to be used by the guests directly in restaurants allowing accurate and informed ordering as the guests can see pictures and read as much info about the menu items before ordering. Stewot is protected by few IPs.

yottolabs

Yottolabs is offering Stewot in an innovative business model as a combination of Software and Hardware as service at a monthly single payment without additional support and maintenance charges to the restaurants.

Yottolabs is now expanding its marketing and support team across India. Our dream is to build a Social Network of the guests in the restaurant allowing them dining in a social environment.

Visit : http://www.yottolabs.com/

ALUMNI ENTREPRENEURS

Mr. Sandeep Saxena

sandeep@actonbiotech.com

Sandeep Saxena has 10 years of experience in Genetics Research, Bioinformatics, Sales and Marketing. He did his summer research project at TIFR.

Sandeep founded Acton Biotech - a laboratory that has been into developing medical genetics tests for the last 6 years. Acton has close to 20 tests right now and all these have been introduced in India for the first time by our lab.

About his company, Sandeep said;

We started with one test to predict response to a drug used in blood cancer and gradually extended our services to include almost all types of cancer and all types of chemotherapy drugs. Further we have launched tests to predict response to cardiology drugs.

We would soon be expanding our test menu to include medical genetic test in nephrology, pediatrics, gynecology and obstetrics, dermatology, asthma, diabetes, psychiatry and other medical conditions.

acton biotech
celebrating genetics

We have been invited as speakers for Indian Science Congress 2010, Clinical Trial Congress 2010, Bangalore Bio 2009, CII Maharashtra Biotech Mission 2009. We have been covered by almost all national dailies, all trade publication and a couple of TV Channels.

It's been a great journey from being a student of genetics at St Xavier college with projects in TIFR in 1993, to working in a couple of companies in different roles to starting a company and making it profitable.

Visit : http://www.actonbiotech.com/home

AWARDS & HONORS

- **National and International**

- **TAA**
  - Felicitation to Ex-Directors, TIFR and Past Presidents, TAA And the PIONEERS AT TIFR
  - TAA EXCELLENCE AWARDS for the year 2009
  - BEST THESIS awards for the year 2008-2009
  - BEST THESIS awards for the year 2009-2010
  - BEST THESIS awards for the year 2010-2011

- **Homi Bhabha Award in Science Education**

AWARDS & HONORS

National and International

- **Prof. Ashoke Sen** received the inaugural Fundamental Physics Prize from the Milner Foundation, an international not-for-profit organization set up by Russian investor Yuri Milner.

- **Prof. K. VijayRaghavan** has been elected to the '"Fellowship" of the Royal Society, London and received HK Firodia Award for 2012 for his original contributions to the field of life sciences.

- **Prof. A.R. Rao** has been elected as a "Fellow" of the Indian Academy Sciences.

- **Prof. R.V. Hosur** was appointed as a Chairman of the Ad-hoc Board of Studies in Biophysics, University of Mumbai, for a period of three years starting from 2011, and awarded "Prof. G.N. Ramachandran Gold Medal-2009" for excellence in Biological Sciences & Technology by the CSIR, New Delhi.

- **Prof. N.K. Mondal** was elected as "Fellow of TWAS", The Academy of Sciences for the Developing World, Trieste, Italy, and Member of the Astroparticle Physics International Forum (APIF) of the Organisation for Economic Co-operation and Development (OECD) Global Science Forum.

- Rajib Goyal Medal in Physical Sciences for year 2005 was awarded to **Dr. V.P.S. AWANA**, Scientist, National Physical Laboratory, New Delhi. (Home Page: http://www.freewebs.com/vpsawana)

- JC Bose Fellowship has been awarded to **Prof. P N Pandita** of NEHU, Prof. **R.K. Shyamasundar** (TIFR) and **Prof. R.V. Gavai** of TIFR.

- NASI-SCOPUS Young Scientist Award for the year 2011 to **Dr. Satyajit Banerjee**, Associate Professor, IIT, Kanpur.

- **Dr. Aravind Chinchure** was elected as Fellow of Society of Technology Management (STEM), India.

AWARDS & HONORS

TIFR Alumni Association Awards

In a programme held in the Lecture theatre of At 2:30 p.m. OCTOBER 31, 2009, **TAA felicitated the Ex-Directors, TIFR and Past Presidents, TAA And the PIONEERS AT TIFR listed below**

- K Chandrasekharan
- N Mukunda
- J V Narlikar
- K Ramachandra
- M S Raghunathan
- R V S Sitaram
- R Vijayaraghavan
- S K Bhattacherjee
- M S Narasimhan
- Raghavan Narasimhan
- P V Ramanamurthy
- V S Narasimham
- R Sridharan
- B M Udgaonkar
- Girjesh Govil
- Yash Pal
- G Rajasekhran
- S Ramani
- C S Seshadri
- Govind Swarup
- C S Warke
- Devendra Lal
- S Ramanan
- Rama
- P V S Rao
- Obaid Siddiqi
- B Venkataraman
- Sukumar Biswas

TAA also distributed TAA EXCELLENCE AWARDS for the year 2009 to the following:

- P Babu
- R Cowsik
- Rohini Godbole
- R R Navalgund
- R Pinto
- Ashoke Sen
- B N Apte
- J N Goswami
- George Joseph
- M V Nori
- Gopal Prasad
- B. S. Shastry
- B M Arora
- S Guha
- Arvind Kumar
- T Padmanabhan
- R Ramaswamy
- Ghanshyam Swarup
- R Balasubramanian
- L C Gupta
- S N Majumdar
- K K Paliwal
- S Rangarajan
- R Parimala

The recipients of the Best thesis awards for the year 2008-2009 are:

Name of the Award :	TAA-Geeta Udgaonkar Award
Recipient :	Dr. Aditya Kelkar
Thesis Title :	Interaction of Fast heavy Ions with C60 Fullerence and Giant Dipole Plasmon Resonance
Name of the Guide :	Dr. Lokesh Tribedi
Honourable Mention :	
Recipient :	Dr. Jayeeta Bhattacharyya
Thesis Title :	Optical Polarization Anisotropy in Semiconductor Heterostructures
Name of the Guide :	Dr. Sandip Ghosh

Name of the Award :	TAA-Harish Chandra Memorial Award
Recipient :	Dr. Vivek Mallick
Thesis Title :	Some Topics in algebraic Cycles: Roitman's Theorem for Singular Projective Varieties in Arbitrary Characteristic
Name of the Guide :	Prof. V. Srinivas

Name of the Award :	TAA-Zita Lobo Memorial Award
Recipient :	Dr. Kalyan K Sinha
Thesis Title :	Specificity of the initial collapse during barstar refolding
Name of the Guide :	Prof. J. Udgaonkar
Honourable Mention :	
Recipient :	Dr. Hanumae Gowd
Thesis Title :	Structural characterization of conotoxins & Identification of their posttranslational modifying enzymes
Name of the Guide :	Prof. K. S. Krishnan
Recipient :	Dr. Niraja Krishnan
Thesis Title :	Insights into Animal Mitochondrial and Plant Chloroplast Genome Replication Mechanisms
Name of the Guide :	Prof. B. J. Rao

The recipients of the Best Thesis awards for the year 2009-10 are:

Name of the Award :	TAA-Geeta Udgaonkar Award
Recipient :	Dr. Arnab Sen
Thesis Title :	Frustrated Antiferromagnets with Easy Axis Anisotropy
Name of the Guide :	Dr. Kedar Damle
Honourable Mention :	
Recipient :	Dr. Aseem Paranjape
Thesis Title :	The Averaging Problem in Cosmology.
Name of the Guide :	Prof. T.P. Singh
Recipient :	Dr. Basudeb Dasgupta
Thesis Title :	Nonlinear Oscillations of Supernova Neutrinos
Name of the Guide :	Prof. Amol Dighe

Name of the Award :	TAA-Harish Chandra Memorial Award
Recipient :	Dr. Aribam Chandrakant Sharma
Thesis Title :	Modular forms and Iwasawa theory.
Name of the Guide :	Prof. R. Sujatha

Name of the Award :	TAA-Zita Lobo Memorial Award
Recipient :	Dr. Sudha Kumari
Thesis Title :	Dynamin-independent endocytosis: molecular mechanisms and membrane dynamics
Name of the Guide :	Prof. Satyajit Mayor
Honourable Mention	
Recipient :	Dr. Himansu Sekhar Biswal
Thesis Title :	Experimental and Computational Investigations of Sigma and Pl-Type Sulfur Centered Hydrogen Bonding in Gas Phase
Name of the Guide :	Prof. Sanjay Wategaonkar

The recipients of the Best thesis awards for the year 2010-11 are:

Name of the Award :	TAA-Geeta Udgaonkar Award
Recipient :	Dr. Swapnil Patil
Thesis Title :	Novel Magnetism in non-magnetic and magnetic materials
Name of the Guide :	Prof. Kalobaran Maiti.
Honourable Mention	
Recipient :	Dr. Shamayita Ray
Thesis Title :	Neutrino Oscillation phenomenology with fermions beyond the standard model.
Name of the Guide :	Prof. Amol Dighe

Name of the Award :	TAA-Harish Chandra Memorial Award
Recipient :	Dr. V.G. Narasimha Kumar
Thesis Title :	On Local Galois Representations attached to Automorphic Forms

Name of the Award :	TAA- Sasken Best Thesis Award
Recipient :	Dr. Chinmoy Dutta
Thesis Title :	Lower Bounds for Noisy Computations
Name of the Guide :	Prof. Jaikumar Radhakrishnan.

Name of the Award :	TAA-Zita Lobo Memorial Award
Recipient :	Dr. Santosh Kumar Jha
Thesis Title :	Characterization of the Nature of Free Energy Barriers During the Folding and Unfolding of Small Proteins.
Name of the Guide :	Prof. Jayant Udgaonkar
Honourable Mention	
Recipient :	Dr. V. Gayatri
Thesis Title :	Investigating intracellular neuronal calcium homeostasis in Drosophila.
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AWARDS & HONORS

Homi Bhabha Award in Science Education

Homi Bhabha Award in Science Education

Name of the Award :	Homi Bhabha Award in Science Education **This award carries a citation and a cash prize of Rs. 20,000/-**
Recipients of this Awards	
Year 2006:	Professor Bakhtaver S. Mahajan
Year 2008:	Professor V. G. Gambhir
Year 2010:	Professor Arnab Bhattacharya

TIFR ALUMNI IN THE NEWS

- **Prof Arun Grover appointed as new PU vice chancellor**
- **Guwahati: Cotton University gets new vice-chancellor**
- **Dr. Prabuddha Ganguli's "*Nanotechnology Intellectual Property Rights.....Research, Design, and Commercialization*" book released in June 2012**
- **Software engineer tries to chip away at globalisation**
- **University of Illinois Professors Receive 2012 Sidney Fernbach Award**

TIFR ALUMNI IN THE NEWS

Prof Arun Grover appointed as new PU Vice Chancellor

Hindustan Times, Chandigarh, June 29, 2012

Professor Arun Kumar Grover, a Senior Professor at the School of Natural Sciences, Tata Institute of Fundamental Research, Mumbai was appointed as the new Vice Chancellor of the Panjab University by Vice President Hamid Ansari on Friday.

Read More on : http://www.hindustantimes.com/Punjab/Chandigarh/Prof-Arun-Grover-appointed-as-new-PU-vice-chancellor/SP-Article1-880837.aspx

Guwahati: Cotton University gets new Vice-Chancellor

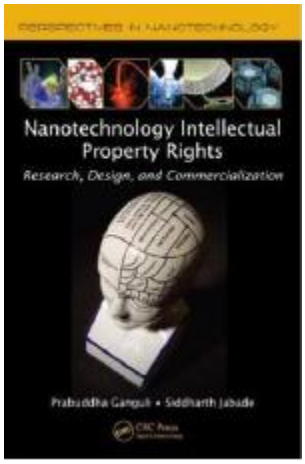
TNN Jun 2, 2012, 06.16AM IST

GUWAHATI: Eminent astrophysicist Dhruba Jyoti Saikia assumed charge as the first vice-chancellor of the Cotton College State University (CCSU) on Friday.
(Please note that Prof. Saikia is a Professor in the National Centre for Radio Astrophysics (NCRA) of TIFR not what has appeared in this TOI report)

Read More on : http://articles.timesofindia.indiatimes.com/2012-0602/news/31983605_1_vice-chancellor-higher-education-faculty-members

Dr. Prabuddha Ganguli's *"Nanotechnology Intellectual Property Rights……Research, Design, and Commercialization"* book released in June 2012

"Nanotechnology Intellectual Property Rights……Research, Design, and Commercialization" book was released by CRC Press (Taylor and Francis Group) in California USA in June 2012 at the Nanotech Conference.



Publication Date: June 22, 2012 | ISBN-10: 1439855285 | ISBN-13: 978-1439855287

Demystifying the accelerating research and product development process of nanotechnology, this book employs illustrations and lucid explanations to examine the integration and exploitation of intellectual property rights (IPR) as a tool in research and development, technology transfer, and safe commercialization. Requiring no prior legal experience of readers, it illuminates the nuances and integral role of IPR in technology development, from product inception through commercialization. This indispensible book destroys illusions in the minds of stakeholders and builds confidence to establish a framework for an agile, working model for product development.

Dr. Prabuddha Ganguli was recently awarded "The Chemtech Pharma-Bio World Award 2011 for outstanding contribution in the field of Intellectual Property".

He has accepted the Ministry of Human Resources IPR Chair Professorship at the University of Tezpur in Assam India.

Software engineer tries to chip away at globalisation

Thursday, January 26, 2012
By Mat Ward

LN Rajaram has started a project aimed at "reversing globalisation" in India.

Last year, software engineer LN Rajaram started Lokalex, a project aimed at "reversing globalisation" in Chennai, India. Green Left Weekly's Mat Ward spoke to him about it.

Read More on : http://www.greenleft.org.au/node/49824

University of Illinois Professors Receive 2012 Sidney Fernbach Award

October 10, 2012

LOS ALAMITOS, Calif., Oct. 10 — Klaus Schulten and Laxmikant "Sanjay" Kale, professors at University of Illinois Urbana-Champaign, have been named the recipients of the 2012 IEEE Computer Society Sidney Fernbach Award.

Kale, an IEEE Fellow, holds a bachelor's degree in electronics engineering from Benares Hindu University, a master's degree in computer science from the Indian Institute of Science, and a PhD in computer science in from State University of New York, Stony Brook. ***He worked as a scientist at the Tata Institute of Fundamental Research from 1979 to 1981, and joined the Illinois faculty in 1985.***

Read More on : http://www.hpcwire.com/hpcwire/2012-10-10/university_of_illinois_professors_receive_ieee_award.html

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