SAMPARK

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FROM THE FOUNDER PATRON

I am very happy to note that the TIFR Alumni Association has decided to publish a regular Newsletter for the benefit of its own members and others in the TIFR family. I hope it will become an important vehicle of networking for everyone concerned with the future progress in the academic activities of the Institute.

The Institute is dedicated to the pursuit of excellence in scientific research that enhances knowledge of nature, and to the training and nurturing of young scientists, mathematicians and engineers, particularly those showing exceptional promise. With the formal establishment of the TIFR Alumni Association on April 29, 2000, the Institute has already received crucial support from its members towards fulfilling our main objectives. It has become one of the most important driving forces for our TIFR Endowment Fund. In years to come, the natural bond between the Institute and its alumni is expected to be further strengthened. We will remain highly indebted to our alumni for their continued commitment towards our objectives and our mission of learning, research and teaching.

Let me conclude by congratulating all concerned who have worked very hard to bring the Alumni Association to the present level and have been able to start the publication of this Newsletter.

Dr. S.S. Jha is the Founder Patron of the TIFR Alumni Association. He can be contacted at ssjha@phy.iitb.ac.in

FROM THE PRESIDENT'S DESK

The TIFR Alumni Association was germinated by a few of its present members in a meeting held on December 24, 1999. It was realized that students and researchers who had spent some of their formative years in TIFR are now spread across India and the globe in further pursuit of knowledge and contributing to the cause of science and technology for the benefit of society in various capacities. Some of them have continued to research actively to push the boundaries of science to newer horizons, some have dedicated themselves to the cause of institution building; many have taken a leading role in the formation and implementation of India's Science and Technology Policies whereas others have shaped into leading Educationists, Techno-entrepreneurs, Technocrats, etc.

It was thought that with the formation of the TIFR Alumni Association one would be in a position to create an integrated resource of different experts and people whose services could be suitably tapped when required. It was also considered necessary to bring into the Alumni Net the present researchers in TIFR as they would not only provide their intellectual might to the Association but would act as a conduit to link the past to the present and create a continuum to the future TIFRites.

A constitution was drafted by an ad-hoc committee on March 18, 2000, and the TIFR Alumni Association came into a formal existence on April 29, 2000 after a membership drive. An interim executive committee took charge on November 18, 2000 after a general body meeting. An executive committee was elected on November 25, 2001 for a two year term as specified in the constitution.

With its humble beginnings the Alumni Association now has a membership of 200 [up from 90 on November 25, 2001]. We need to tap all the potential members to get into this network and participate in the noble efforts of the Association. The Association now has established chapters in Bangalore, Delhi, and USA.

In the past one and a half years, the Association has focused on how to enhance the scientific vibrancy in TIFR, contribute to human resource building, to spread the message of curiosity, fun of doing science and converting some of the findings into fruitful results for use in society.

The Association has:

- Instituted 3 Annual "Best Thesis Awards" in TIFR in the fields of Physics, Biology, Chemistry, Mathematics and Computer Science. The Awards

carry a cash prize, a citation and a medal. These Awards are called a) TAA – Geeta Udgaonkar Memorial award in Physics, b) TAA – Harish Chandra Memorial award in Mathematics and Computer Science and Technology, and c) TAA – Zita Lobo Memorial award in biological and chemical sciences". The awards have been instituted jointly with Donors.

- Organised to collect 31 Lakhs for the TIFR Endowment Fund to be utilised as "Career Development Fund" to assist the Ph.D students in TIFR for their growth, purchase of books, attend conferences in India and abroad, etc. It is expected that these incentives will drive the research student to achieve newer heights in their quest for knowledge and contribute to build up the scientific temper in India.

- Organised a "Public Lecture Series"; till date three lectures have been delivered by the TIFR Alumni Professor J. V. Narlikar, Professor M. S. Raghunathan and Professor Yash Pal. TAA has also decided to celebrate Bharat Ratna JRD Tata's Birthday every year with a Public Lecture.

We have a long way ahead and a lot needs to be done. The Association will continue to strive to achieve what it has already committed and chart newer paths as is envisioned by its members. This newsletter hopes to link us one and all in this endeavor. We look forward to your contribution to the activities of the TIFR Alumni Association and work towards furthering the goals of TIFR in its efforts to provide a spring board for scientific thought and action now and for ever.

Dr. Prabuddha (Ramu) Ganguli is the President of TAA. He can be contacted at ramugang@vsnl.com

Upcoming Events

➢ *4th Public Lecture by Dr. Subhendu Guha on December 20, 2002*

➢ *5th Public Lecture by Prof B.M. Udgaonkar on National Science Day, February 28, 2003*

➢ *6th Public Lecture by Prof Obaid Siddiqi, FRS, on J.R.D. Tata's Birthday, July 29, 2003*

TIFR ALUMNI ASSOCIATION CONSTITUTION

1.Name and Office:

The Association shall be called the "TIFR ALUMNI ASSOCIATION" (hereinafter referred to as "THE ASSOCIATION"), of the Tata Institute of Fundamental Research, hereafter referred to as the Institute, and its Office shall be located at the Tata Institute of Fundamental Research (TIFR), Homi Bhabha Road, Colaba, Mumbai 400 005.

2. Aims and Objectives:

The aims and objectives for which the Association is established are:

(a) To provide a forum for members of the Association for interaction and to sustain a sense of belonging amongst the members of the Association with TIFR through mutually beneficial contacts .

(b) To provide avenues for drawing upon the knowledge and expertise of the alumni for furthering the cause of the Institute as a leading Center of excellence.

(c) To foster linkages amongst the alumni and to promote personal and friendly relations through meetings and get-togethers among members of the Association.

(d) To collect, publish and distribute such information as may be useful to members of the Association.

(e) To undertake all such activities as are incidental or conducive to the attainment of the above aims and objectives.

3. Financial Year:
The Financial year of the Association shall be from April 1st to March 31st.

4. Membership:

Eligibility:

Membership of the Association shall be open to:

i)Anyone who has acquired a Post-graduate degree of M. Sc./ M. Tech. / Ph. D. through the Institute OR

ii) Any ex-member who has worked at the Institute for at least 2 years as a member of academic staff or as a scientific officer and is no longer with the Institute OR

iii)Any ex-member who has worked in the Institute as a post-doctoral visiting fellow for at least one year.

iv) The Director of the Institute shall be an *ex-officio* patron of the Association and, being its patron, shall enjoy all the privileges of a member.

5. Membership and payment of subscription:

Any person satisfying Article 4 will be eligible to be a member and shall become a member on payment of membership fee. There shall be a one-time Life Membership fee of Rs.1000/-, or an annual membership of Rs. 250/-, which may be changed by the General Body from time to time.

6. Management of the Association:

The Management of the Association shall be vested in an Executive Committee. It shall consist of not less than 11 and not more than 15 members and shall be constituted as follows:

a)The President of the Association, to be elected at the Biennial or Special General Meeting called for the purpose;

b) Director of the Institute and another member of the Institute to be nominated by the Director as *ex-officio* members (this member need not be a member of the association);

c) Eight members to be elected at the Biennial or Special General Meeting called for the purpose;

d) The Executive Committee may co-opt upto 4 members.

e) The President and at least half of the rest of the members of the Executive Committee shall not be current members of TIFR.

6.1 The mandate of the Executive will be for a period of two years. It will be responsible for running the Association for fulfilling the objectives stated in Article 2 and other programs of benefit to the organization. It will be authorized to accept donations, gifts and bequests for the furtherance of the aims and objectives of the Association. No member of the Association shall enter into any dealings on behalf of the Association, unless the Executive Committee has previously authorized him or her.

6.2 Any casual vacancy occurring in the Executive Committee, except that of President, may be filled by the Executive Committee by co-option from time to time without changing the basic structure of the Executive Committee as prescribed in Article 6 a) to e).

7. The Executive Committee shall elect from among their members the following Office-bearers:

a) A Vice-President
b) A Secretary
c) A Joint Secretary and
d) A Treasurer.

The Secretary and the Treasurer shall be Mumbai based.

8. The Executive Committee may appoint from time to time from among its Members such Sub-Committee, or partly from among its Members and partly from among the Members of the Association such Special Committee as may be required, and shall prescribe the terms of reference, powers and privileges of such Sub-committee or Special Committee.

9. Bank Account, Investments, etc.:

Management of account:

a) Any two persons (and not less than two), being (i) the Treasurer and (ii) either the President, the Vice President, or the Secretary, shall operate jointly the Association's Bank account.
b) The Association's investments and any other property shall be held in the names of any three Members of Association, to be selected by resolution of any Executive Committee, and the said three Members shall remain as such holders until resignation, death, or replacement of any of them by a resolution of any Executive Committee in office for any reason at their sole discretion.
c) The Executive Committee may also, by resolution, designate three Members of the Association to sign any documents, etc., other than those referred to in paragraph (a) and (b) of this Article, on behalf of and binding on the Association. Every such designation shall be specific, and shall cease after completion of its purpose.

10. All accounts in Banks or any other institutions shall be held in the name of the Association as prescribed in Article 9 a) above.

11. Executive Committee Meetings:

The Executive Committee shall meet as often as may be necessary, but not less than twice every year to transact the business of the Association. The President shall preside at such meetings. In his absence, the Vice-President shall preside, and in the absence of the President and of the Vice-President, the members present at the meeting shall elect one amongst themselves to preside.

12. Any elected or co-opted Member of the Committee absenting from three consecutive committee meetings without prior intimation shall be deemed to have vacated the respective office.

13. Five members shall form a QUORUM for Executive Committee meetings. If there is no quorum in the meeting, the presiding person may decide on the place and time of the next meeting for which no quorum will be required.

14. At least ten days' notice shall be given for a meeting of the EXECUTIVE COMMITTEE. The meeting shall be convened by the Secretary designated for the purpose, in consultation with the President and the Director of the Institute. Any five Members of the Committee may request the Secretary to call a meeting of the Committee by requisition in writing, stating the object for which they desire that the meeting be called, and thereupon the Secretary shall proceed to do so. In the event of the Secretary failing to convene such meeting within thirty days after receipt of the requisition by him, the members who requested for the meeting may themselves convene a meeting of the Committee on due notice.

15. Annual General Meeting:

The Annual General Meeting of the Association shall be held every year not later than 15 months after the holding of the previous Annual General Meeting to transact the following business:

a) to consider the Annual Report and Audited Statement of Accounts.
b) to elect the President and other members of the Executive Committee at a Biennial General Meeting of the Association, unless this election was already held during the year at a Special General Meeting called for the purpose.
c) to appoint Auditor or Auditors and to fix their remuneration , if any;
d) to consider any other matter on the agenda.

16. A notice convening the ANNUAL GENERAL MEETING shall be sent, together with the Agenda by the Secretary, to each Member at least fourteen days before the date of the meeting.

17. The notice of any motion to be proposed at the Annual General Meeting shall be sent to the Secretary in advance, so that it may be included in the Agenda of a subsequent meeting.

18. The President, and in his absence, the Vice-President, shall preside at such meeting. In the absence of both of them, those present shall elect one amongst themselves to preside.

19. THE QUORUM shall be thirty members. In the event of there being no quorum at the time and place specified for a General Meeting, the same may be held by those present to be adjourned at the same place to a time 15 minutes later on the same day. At such an adjourned meeting the business on the Agenda may thereafter be transacted, even if there is no quorum.

20. Procedure at General Meetings:

Articles 16, 18 and 19 shall apply also to other General Meetings, unless otherwise specified herein below.

Procedure for election:

21. *Voting and other procedures*

a) All matters at any General Body Meeting, except the election of the President and elected 8 members of the Executive Committee, shall be determined by show of hands, or if challenged, by a division, and no voting by proxy shall be permitted.
b) Election of the President shall be through a mail ballot and the other Members of the Executive Committee shall be by mail ballot, and no voting by proxy shall be permitted.
c) In case of equality of votes in both (a) and (b), the person presiding over the Meeting shall have a casting vote in addition to his own vote.

The Executive Committee will decide on the appointment of returning officer(s), and the procedure for receiving and counting of votes etc. The returning officer shall be responsible for receiving nominations, sending out the ballots, receiving the responses, counting and announcement of results.

22. Twenty five members of the Association may request the Secretary to call a Special General Meeting by a requisition in writing, stating the objective for which they desire that the meeting be called, and thereupon the Secretary shall proceed to do so after consultation with the Executive Committee. In the event of the Secretary failing to convene such meeting within 60 days of the receipt of the requisition, the members requesting the meeting may themselves convene a Special General Meeting on due notice.

23. Notwithstanding anything contained in Article 22, the Managing Committee shall be entitled to call a Special General Body Meeting for carrying out the purposes of these Articles and of the Association. The notice, quorum and all procedural aspects relating to such Special General Body Meeting shall be the same as those provided in these Articles, in respect of Annual General Body Meetings.

Amendments to the Constitution:

24. Amendments to the Constitution of the Association as formulated in these Articles may be made from time to time by the General Body assembled in any Annual or Special General Body Meeting, provided there is always at least two-thirds of the members present and entitled to vote at a meeting shall vote in favor of such amendment.

25. Article 16 and 17 above shall be complied with for holding such Special General Body Meeting for consideration of any proposal of amendment. At such Meeting the QUORUM shall be thirty, and Article 19 shall not be applicable.

26. Any proposal of amendment shall be circulated along with the notice convening the meeting for the purpose.

27. Dissolution of the Association:

Procedure for dissolution

a) A proposal for the dissolution of the Association shall be considered at a Special General Meeting called exclusively for the purpose, and shall be determined by not less than a three-quarters majority of the Members present and entitled to vote.
b) The QUORUM for such a meeting shall be one-third of the number of Members on the Register of the Association, and Article 19 shall not be applicable.
c) The proposal, if carried by such a majority shall be required to be confirmed by a like majority and a like quorum at a subsequent Special General Meeting, called exclusively for the purpose of confirmation, to be held not earlier than 60 days from the date of the previous meeting.

28. Articles 16, 18 and 26 above shall be complied with *mutatis mutandis.*

29. In the event of dissolution, the funds and assets of the Association shall be transferred to the Tata Institute of Fundamental Research Endowment Fund.

OUTREACH

The Executive Committee of TAA has decided to sponsor about three to four Public Lectures every year. The lectures will be delivered by eminent alumnus or others who have made significant contribution to the cause of science and education.

The first lecture was given by Prof. Jayant Narlikar on January, 16 2002 the second lecture was delivered by Prof. M.S. Raghunathan on February, 28 2002 and the third lecture was by Prof. Yash Pal on July, 29 2002. Bharat Ratna Shri J.R.D. Tata was born on this date and the TAA thought it appropriate to remember this illustrious son of India in this manner.

The Trials and Excitement of Setting up a Scientific Institution
Jayant V. Narlikar

Abstract of the talk given by Prof. Jayant V. Narlikar on January 16, 2002

In the introductory part of the lecture Prof. Narlikar mentioned about the experiences of Prof. Hoyle in setting up a new Laboratory for Astrophysics at Cambridge (U.K.). Initially there was considerable resistance to the idea and then Prof. Hoyle was asked to set up the new laboratory near the famous Greenwich Laboratory. Prof. Hoyle did not accept the suggestion as Greenwich Laboratory did not have adequate research facilities and students to teach. Prof. Hoyle like Prof. Narlikar, considered teaching quite essential for giving birth to good research; teaching and research compliment each other. In a few years time Prof. Hoyle was allowed to set up the new laboratory in Cambridge, but denied the privilege to teach.

After a few years Prof. Hoyle's laboratory became famous, he and his colleagues were allowed to teach as well at Cambridge University. An interesting development took place during this time that Greenwich Laboratory was asked to move to Cambridge, near Hoyle's Laboratory subscribing to the modified reverse proverb `*Mountain comes to the Prophet* '.

Coming to his own experiences of setting up an Inter University Centre for Astronomy and Astrophysics (IUCAA) at Pune, Prof. Narlikar acknowledged the suggestions and help of Prof. Yash Pal. Prof. Narlikar explained that he started building IUCAA in an unconventional way. Contrary to the prevailing Government rules, where Public Works Department (P.W.D.) is asked to design the buildings, Prof. Narlikar requested the famous architect Charles Correa to design the IUCAA Laboratory. Fortunately, Charles gladly agreed to design the laboratory, though Prof. Narlikar was a little apprehensive that he may not accept the job thinking it to be too small a project.

The second deviation Prof. Narlikar made was that the residential homes for staff were built in the beginning and then the Institute building was constructed. This approach was found to be more convenient as well as successful. In case one ever has a shortage of funds, it is easier to raise additional funds for constructing an incomplete laboratory than incomplete residential homes.

Prof. Narlikar went on to describe his experiences of interacting with junior college students at IUCAA. Every year a group of young students come to IUCAA and work on small projects of some relevance. This way the young minds are exposed to the modern methods of research in Astrophysics. Students also manage time and tackle large or small problems. In this context Prof. Narlikar told an interesting story going round on the internet:

A teacher gave a demonstration to a class of students. He took a bucket and filled it with big stones. He asked the students whether the bucket was full or not. All the students replied with one voice, that the bucket is full. Then teacher took smaller stones and dropped them in the same bucket. All small stones went inside the bucket, in spaces between the large stones. The teacher asked again, is the bucket full? By now the students had become wiser and replied, no. They even suggested that the bucket can accommodate some sand even now. The teacher complied and poured some sand in the bucket. He asked the same question, is the bucket full now? The students again replied in negative and suggested that it can accommodate some water in it.

The teacher explained that you can utilize your time in a similar fashion. In between big jobs you do, you can accommodate smaller jobs.

In the second part of the demonstration, the teacher filled the bucket with smaller stones, and asked if he can put big stones in the bucket now. Students replied in negative. The teacher explained again that if you engross yourself with smaller problems, you will not be able to accommodate larger problems.

A large number of young students between the age group 10-18 years were present in the audience.

They in particular and other audience in general, liked the example and cheered with applause. The lecture was well attended by a large gathering and the auditorium was more than 2/3 full.

Dr. J.V. Narlikar is the Founder Director of IUCAA, Pune. He can be contacted at jayant@iucaa.ernet.in

Kaun Banega Crorepati - a Million Dollars for a Mathematician
Prof M.S. Raghunathan

Abstract of the talk by Prof M.S. Raghunathan on February 28th 2002

In the year 2000 (declared World Mathematical Year by UNESCO), the Clay Institute, an institution for the promotion of Mathematics set up by the philanthropic private trust, The Clay Foundation, announced the institution of seven prizes of one million dollars each for the solutions of each of seven important mathematical problems. All these problems are problems in Pure Mathematics though 3 of them are inspired by Fluid Mechanics, Computer science and Theoretical Physics. The year 2002 is the bicentenary year of birth of Henrik Abel, one of the great mathematicians of all time and the greatest from Scandinavia. The Norwegian government announced in November 2001 the institution of a prize for Mathematics along the lines of the Nobel Prize (which is not given for Mathematics) to be called the Abel Prize to commemorate the bicentenary. Thus there are new avenues for the (pure) mathematician to become a crorepati even though KBC is no longer on the air!

Five of the Clay problems are conjectures made by well-known mathematicians. The oldest, known as Riemann Hypothesis is a conjecture (made in mid 19th century) by the German Bernhard Riemann, one of the greatest mathematicians of all time. Riemann posed a question in number theory and he also stated what he expects the answer to be. The next Clay problem in chronological order of appearance is the Poincare conjecture. Henri Poincare, a Frenchman, again an all-time great in Mathematics, was the founder of Topology, a central and important area in Mathematics. His conjecture on what are known as 3 dimensional manifolds has fascinated mathematicians and has remained now unsolved for almost a century. A description of this problem is the main subject of the present talk. Certain differential equations known as the Navier Stokes Equations govern the flow of fluids. The French mathematician, Jean Leray, one of 20th century's most original minds in Mathematics, made some very important contributions to the study of these equations and went on to ask certain questions about these equations indicating what he expects by way of an answer. One of the Clay prizes is for solving the problem posed by him. Algebraic Geometry is one of the areas of mathematics where there are a lot of exciting developments going on now. W.V.D. Hodge, a British mathematician made a conjecture in this branch of Mathematics and many mathematicians of the first rank are trying to settle this conjecture, which is one of the Clay Prize problems. The last of the 5 problems is a conjecture proposed jointly by two British mathematicians B. J. Birch and J.F.P. Swinnerton- Dyer. This is again a problem in Number Theory.

As mentioned above, the Poincare Conjecture is a problem in topology. In topology one studies `geometric objects'. These are subsets of the n-dimensional Euclidean space, A point in the n-dimensional Euclidean space is simply an n-tuple of (real) numbers: the n numbers are the coordinates of the point. In analogy with the usual notion of distance in 3-dimensional space one defines the distance between two points in Euclidean n-dimensional space as the square root of the sum of the squares of the differences between the coordinates of the two points. With this notion of distance, two geometric objects A and B are said to be homeomorphic or topologically equivalent if there is a one to one correspondence between points of A and B in such a way whenever the distance d(p,p') between two points p,

p' in A shrinks to zero so does the distance between the corresponding points q and q' in B and conversely. A geometric object M is a 3 dimensional manifold if every point p in M is surrounded by a region R, which contains all points at a distance less than r from p and is such that R is homeomorphic to the set of all points of 3-dimensional Euclidean space within unit distance of the origin. The manifold M is connected if given any two points p, p' on M there is a continuous arc joining the two. It is simply connected if every closed curve lying on it can be deformed continuously to a point; Finally M is said to be compact if it is contained in a finite union of subsets each of which is homeomorphic to the closed unit disc (viz. the set of all points which are at distance at most 1 from the origin) in 3-dimensional Euclidean space. With these definitions the conjecture states the following:

Any compact connected and simply connected 3-dimensional manifold is homeomorphic to the 3-sphere namely the set of points in Euclidean 4-dimensional space at exactly unit distance from the origin.

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WELCOME TO THE NEW DIRECTOR

Shobo Bhattacharya is the new Director of TIFR and the Patron of the TAA.

Professor Sabyasachi (Shobo) Bhatttacharya is the new Director of TIFR from November 1, 2002. Shobo has been associated with TIFR since 1996-97, when he spent a sabbatical year at TIFR. In 1998, he was offered the position of a Professor at TIFR. He has been an Adjunct Professor in the Department of Condensed Matter Physics and Material Science in TIFR, since 1998. He was a Distinguished Visitor at TIFR under the Sarojini Damodaran Internbational Fellowship programme in the year 2001-02. He is a Fellow of the APS.

Before coming to TIFR, Shobo held the highest academic rank of Fellow at the NEC Research Institute, Princeton, USA. Prior to that he spent several years at the Corporate Research Labs of Exxon, where he worked on charge density waves, cuprate superconductors, and micellar and micro emulsion systems. His current research focuses on magnetic flux lattices in type II superconductors and in superconducting wire networks.

He obtained his M.Sc. in physics from Delhi University, Ph.D. from the Northwestern University, Evanston, USA in 1978. He worked on the hydrodynamics of liquid crystals for his Ph.D., and on glassy systems during his postdoctoral work at the University of Chicago.

Prof. Sudhanshu S. Jha, the first Patron, TAA, took superannuation from TIFR as its Director, on October 31, 2002, after more than forty four years of distinguished service as an academic member of the Institute. While becoming a regular member of TAA from November 1, 2002, Prof. Jha made available to the Secretary, TAA a sum of Rupees One lakh towards the TIFR Endowment Fund. With the concurrence of the donor, it is now proposed to initiate an Excellence in Teaching Award at TIFR @ Rs.20,000/- per award by treating one lakh as the nuclear corpus amount. It is hoped that more donations will flow into this corpus fund from individual donors, the corporate friends and other well wishers of TIFR.

Prof. S. Bhattacharya, new Director, TIFR and new Patron TAA, addressing the TIFR Community on the Founder's Day, October 30, 2002. The first Patron TAA, Prof. S. S. Jha and new Registrar, Mr. T. Sahay can be seen in the background.

First Patron, TAA Nucleates Excellence in Teaching Award at TIFR

Prof. J.V. Narlikar gave the first TAA public lecture on January 16, 2002. He is the Founder Director of IUCAA.

Prof. M. S. Raghunathan, FRS (TIFR) was the speaker at the second TAA public lecture on National Science Day, 2002 (Feb. 28, 2002). He is also the Chairman NBHM.

Professor Yash Pal delivering the first J.R.D. Tata Lecture of TAA public lecture series on JRD's birthday (July 29, 2002)

Dr Anil Kakodkar, Prof S.S. Jha, Shri Ratan Tata, Shri Rahul Bhattacharya, and Mrs Sudha Murty in a lighter mood.

A section of the audience participating in a TAA public lecture.

Do you know someone who is not a member of TAA? Please request him/her to contact the TAA at alumni@tifr.res.in