



## Yearly Status Report - 2018-2019

### Part A

#### Data of the Institution

Part A	
<b>Data of the Institution</b>	
<b>1. Name of the Institution</b>	TATA INSTITUTE OF FUNDAMENTAL RESEARCH
Name of the head of the Institution	Prof. Sandip Trivedi
Designation	Director
Does the Institution function from own campus	Yes
Phone no/Alternate Phone no.	02222782306
Mobile no.	9892105000
Registered Email	iqac@tifr.res.in
Alternate Email	director@tifr.res.in
Address	1, Dr. Homi Bhabha Road, Navy Nagar, Colaba,
City/Town	Mumbai
State/UT	Maharashtra
Pincode	400005

<b>2. Institutional Status</b>	
University	Deemed
Type of Institution	Co-education
Location	Urban
Financial Status	central
Name of the IQAC co-ordinator/Director	Prof. Amol Dighe
Phone no/Alternate Phone no.	02222782432
Mobile no.	9967396593
Registered Email	iqac@tifr.res.in
Alternate Email	deangs@tifr.res.in

<b>3. Website Address</b>	
Web-link of the AQAR: (Previous Academic Year)	<a href="https://www.tifr.res.in/NAAC/TIFR-AQAR-17-18.pdf">_https://www.tifr.res.in/NAAC/TIFR-AQAR-17-18.pdf</a>
<b>4. Whether Academic Calendar prepared during the year</b>	Yes
if yes,whether it is uploaded in the institutional website: Weblink :	<a href="https://www.tifr.res.in/~sbp/new2015/Academic Calendar 2018.pdf">https://www.tifr.res.in/~sbp/new2015/Academic Calendar 2018.pdf</a>

**5. Accrediation Details**

Cycle	Grade	CGPA	Year of Accrediation	Validity	
				Period From	Period To
1	A+	3.68	2016	02-Dec-2016	01-Dec-2021

<b>6. Date of Establishment of IQAC</b>	15-Feb-2016
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**7. Internal Quality Assurance System**

Quality initiatives by IQAC during the year for promoting quality culture		
Item /Title of the quality initiative by IQAC	Date & Duration	Number of participants/ beneficiaries
Computer-based nationwide	09-Dec-2018	21787

written test for admissions (see the attachment for more entries)	1	
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**8. Provide the list of Special Status conferred by Central/ State Government-UGC/CSIR/DST/DBT/ICMR/TEQIP/World Bank/CPE of UGC etc.**

Institution/Department/Faculty	Scheme	Funding Agency	Year of award with duration	Amount
Tata Institute of Fundamental Research	NA	Not Applicable	2019 0	0
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**9. Whether composition of IQAC as per latest NAAC guidelines:**

Yes

Upload latest notification of formation of IQAC

[View File](#)

**10. Number of IQAC meetings held during the year :**

1

The minutes of IQAC meeting and compliances to the decisions have been uploaded on the institutional website

No

Upload the minutes of meeting and action taken report

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**11. Whether IQAC received funding from any of the funding agency to support its activities during the year?**

No

**12. Significant contributions made by IQAC during the current year(maximum five bullets)**

1. TIFR was included in the 12B list of UGC. 2. The nationwide written entrance test of TIFR, GS2019, was made computerbased this year. It was conducted with the help of Tata Consulting Services in all the Centres (more than 30), and the experience was very positive for all the Subject Boards involved (Physics, Chemistry, Biology, Mathematics, CSS). It is planned to continue with the computerbased tests even in the future. 3. The online module for Visiting Students Research Programme (VSRP) which is conducted in summer, for selections, has now been developed inhouse in TIFR Colaba and will be used for the 2019 VSRP program. Earlier, software developed by an external agency was being used. 4. Funds were raised for travel expenses of students from external philanthropic sources for example the Sarojini Damodaran Fellowships for the travel of students abroad for collaborations and conferences, as well as for inviting eminent visitors to TIFR.

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**13. Plan of action chalked out by the IQAC in the beginning of the academic year towards Quality Enhancement and outcome achieved by the end of the academic year**

Plan of Action	Achievements/Outcomes
To renew the TIFR-HBNI MOU	TIFR-HBNI MOU was renewed paving way for common courses between two deemed to be universities.
To computerize the University Cell Procedures	Computerization of University Cell procedures is being carried out in steps. Synopsis reports and course feedback forms are now already computerized for some Subject Boards, the same will be done for the forms for Registration, thesis submission, etc.
To make Visiting Students Research Programme selection online.	The online module for Visiting Students Research Programme (VSRP) selections has now been developed in-house in the Main Campus and will be used for the 2019 VSRP program. Earlier, software developed by an external agency was being used.
To raise funds for travel expenses of students from external philanthropic sources.	Funds were raised for travel expenses of students from external philanthropic sources for example the Sarojini Damodaran Fellowships for the travel of students abroad for collaborations and conferences, as well as for inviting eminent visitors to TIFR.
In the Main Campus, to make on-campus accommodation available to all incoming students	In the Main Campus, arrangements were made to provide on-campus accommodation to all incoming Ph.D. students. With timely room-transfers of students (and more students completing their PhDs on time), this may be made a regular feature.
Updation of University Rules and Procedures	The "University Rules and Procedures" document was updated.
Converting the paper-based written entrance test for the Graduate school admissions to online mode.	The nationwide written entrance test of TIFR, GS2019, was made computer-based this year. It was conducted with the help of Tata Consulting Services in all the Centres (more than 30) and it is planned to continue with the computer-based tests even in the future.
Revision of honoraria for the thesis examiners.	Honoraria for the thesis examiners were revised from Rs.5000 to Rs.10000 (for Ph.D. thesis). Honoraria for vivavoce and M.Sc. theses were also correspondingly revised upwards, starting October 2018.

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14. Whether AQAR was placed before statutory body ?

Yes

Name of Statutory Body

Meeting Date

Institute Academic Council

30-Sep-2020

15. Whether NAAC/or any other accredited body(s) visited IQAC or interacted with it to assess the functioning ?

No

16. Whether institutional data submitted to AISHE:

Yes

Year of Submission

2019

Date of Submission

28-Feb-2019

17. Does the Institution have Management Information System ?

Yes

If yes, give a brief description and a list of modules currently operational (maximum 500 words)

Datanet is the panTIFR Management Information Systems, which is TIFR's Integrated Information System (TIIS) for accounting, budgeting, procurement, material receipts, and inventory. Another module MANCH is used for sharing minutes of meeting and wider consultation among the faculty members. Additionally, individual centers have developed independent local modules to cater to their needs. [NCRA] PACTS Module at NCRA has been modified to include the online APAR tracking for all staff members. [ICTS:] ICTS One account: It is an LDAP based user account. LDAP is the Lightweight Directory Access Protocol that includes Intranet, Internet through mac address registration (at ICTS), HPC cluster access, Private cloud storage, Gitlab Access, Eduroam wireless, VPN (Virtual private network), etc. eSSL eTime eTracklite Server (Attendance software) This software is used to manage the attendance of the employees through biometric/ RFID ID card. Online Application Portal for Long Term Visiting Students Program (LTVSP) Faculty Recruitment, PDF Archive Page. [TIFRH:] TIFRHyderabad has created a Dashboard for Academics: An integrated

module on Dashboard for course registration, Feedback, Grading, Teaching related information Guest User Management (Aruba GPP): An interface to create Guest Internet/wifi accounts with validity. Datanet, LDAP, MANCH, PACTS

## Part B

### CRITERION I – CURRICULAR ASPECTS

#### 1.1 – Curriculum Design and Development

1.1.1 – Programmes for which syllabus revision was carried out during the Academic year

Name of Programme	Programme Code	Programme Specialization	Date of Revision
PhD or DPhil	PhD-Biol	Biology	01/08/2018
<a href="#">View File</a>			

1.1.2 – Programmes/ courses focussed on employability/ entrepreneurship/ skill development during the Academic year

Programme with Code	Programme Specialization	Date of Introduction	Course with Code	Date of Introduction
PhD or DPhil	Science Education	01/08/2018	Teaching practice and school internship/ design of learning resource Part 1 (SCE-103.2)	01/08/2018
<a href="#">View File</a>				

#### 1.2 – Academic Flexibility

1.2.1 – New programmes/courses introduced during the Academic year

Programme/Course	Programme Specialization	Dates of Introduction
PhD or DPhil	Biology	01/08/2018
<a href="#">View File</a>		

1.2.2 – Programmes in which Choice Based Credit System (CBCS)/Elective Course System implemented at the University level during the Academic year.

Name of programmes adopting CBCS	Programme Specialization	Date of implementation of CBCS/Elective Course System
PhD or DPhil	Biology	01/08/2018
Integrated(PG)	Biology	01/08/2018
PhD or DPhil	Chemistry	01/08/2018
Integrated(PG)	Chemistry	01/08/2018
PhD or DPhil	Computer Systems Science	01/08/2018
Integrated(PG)	Computer Systems Science	01/08/2018

PhD or DPhil	Mathematics	01/08/2018
Integrated(PG)	Mathematics	01/08/2018
PhD or DPhil	Physics	01/08/2018
Integrated(PG)	Physics	01/08/2018
PhD or DPhil	Science Education	01/08/2018
MSc	Biology	01/08/2018
MSc	Wild Life Biology and Conservation	01/08/2018

### 1.3 – Curriculum Enrichment

#### 1.3.1 – Value-added courses imparting transferable and life skills offered during the year

Value Added Courses	Date of Introduction	Number of Students Enrolled
Science Journalism (see the attachment for more entries)	01/08/2018	46
<a href="#">View File</a>		

#### 1.3.2 – Field Projects / Internships under taken during the year

Project/Programme Title	Programme Specialization	No. of students enrolled for Field Projects / Internships
PhD or DPhil	Science Education	1
<a href="#">View File</a>		

### 1.4 – Feedback System

#### 1.4.1 – Whether structured feedback received from all the stakeholders.

Students	Yes
Teachers	Yes
Employers	No
Alumni	No
Parents	No

#### 1.4.2 – How the feedback obtained is being analyzed and utilized for overall development of the institution? (maximum 500 words)

Feedback Obtained
<p>On the academic front, the online anonymous feedback system is used for students where the questionnaire in a Google form is distributed and students are asked to fill it without disclosing their identity. This exercise is carried out at the end of each semester. Some programmes like PhD-Phys at the Main Campus engages with the students twice in a semester to obtain this feedback about the courses taught, in the middle of a semester and at the end of the semester before the final examination. The middle of the semester feedback is used to make appropriate changes in the teaching like pace, the difficulty level of the assignments, etc. For each course, the students evaluate the pedagogical aspects such as course contents, course methodology, pedagogical ability, expertise, originality, personal skills with students, the overall impact of the course, etc. This feedback is used by the teachers to improve the courses. Both the sets of feedbacks are shared with the course instructors. The feedback also includes that on the tutorials and tutors. In some programmes, feedbacks about the course syllabi are also obtained and then</p>

the respective subject board carries out the fine-tuning of the syllabi based on this feedback from teachers and students. In HBCSE, at the end of the entire course work by a student, comprehensive feedback is obtained. The feedback is factored into redesigning the overall course structure. On the campus life issues, regular feedback on hostel issues is also obtained by the Hostel Committee from hostel residents in NCRA every 2-3 months, and action is taken based on this input. NCRA has also been obtaining feedback from the alumni. For that purpose, a committee has been formed to review the Graduate School structure and courses the committee contains faculty members from IUCAA and NCRA, who jointly conduct the Graduate School. The feedback from the alumni is being discussed by this committee and will inform proposed changes in the Graduate School structure and courses.

## CRITERION II – TEACHING- LEARNING AND EVALUATION

### 2.1 – Student Enrolment and Profile

#### 2.1.1 – Demand Ratio during the year

Name of the Programme	Programme Specialization	Number of seats available	Number of Application received	Students Enrolled
PhD or DPhil	Biology	35	4144	35
<a href="#">View File</a>				

### 2.2 – Catering to Student Diversity

#### 2.2.1 – Student - Full time teacher ratio (current year data)

Year	Number of students enrolled in the institution (UG)	Number of students enrolled in the institution (PG)	Number of fulltime teachers available in the institution teaching only UG courses	Number of fulltime teachers available in the institution teaching only PG courses	Number of teachers teaching both UG and PG courses
2018	Nil	188	Nil	255	Nil

### 2.3 – Teaching - Learning Process

#### 2.3.1 – Percentage of teachers using ICT for effective teaching with Learning Management Systems (LMS), E-learning resources etc. (current year data)

Number of Teachers on Roll	Number of teachers using ICT (LMS, e-Resources)	ICT Tools and resources available	Number of ICT enabled Classrooms	Number of smart classrooms	E-resources and techniques used
255	255	12	53	30	5
<a href="#">View File of ICT Tools and resources</a>					
<a href="#">View File of E-resources and techniques used</a>					

#### 2.3.2 – Students mentoring system available in the institution? Give details. (maximum 500 words)

Across all the subject boards, each student gets a thesis committee usually comprised of three members, one of whom is the thesis advisor of the student. This committee is usually formed at the time of Ph.D. registration. The primary objective of this committee is to actively mentor the student throughout his/her thesis work by regularly meeting and discussing various issues pertaining to the thesis work progress. This committee meets the student at least once every year to take stock of the students progress. Apart from that, the members of the committee (other than the thesis advisor) regularly interact with the student informally and discuss issues that the student is facing and offer help if required to address them. The committee gives a report on the students progress at the end of the academic year which is taken into consideration while deciding the extension of the research fellowship of the student. Any grievances that arise for the student are first brought to the TC that actively seeks to address the issues and provide redressal for the student. In the Biology Subject Board, the thesis committee



actively mentors the student right from his/her entry to the graduate school discussing choices of courses, details of thesis work, etc. In the Physics Subject Board, prior to registration for the thesis, the student is either assigned to a mentor or a three-member internal committee is formed to actively mentor the student. The mentor discusses various academic as well as non-academic issues with the students to help them adjust to the graduate student life at the institute. The mentors also discuss any problems for which the students need assistance of any kind. In the mathematics subject board, the initial couple of years involve rigorous course work where the feedback from the instructors and graduate studies committee is taken regularly and used to mentor students through their course work. In the Science Education subject board, every new student is assigned to a mentor who guides the student through the course work. At the end of two years, the student is asked to take a comprehensive exam and then carry out fieldwork. The outcome of these activities results in the student joining a thesis advisor for the desired thesis problem. For the students who join the MSc programme, their academic progress is monitored regularly by faculty members of the respective department. The students give regular seminar presentations which are attended by all the faculties and appropriate feedback is given to them.

Number of students enrolled in the institution	Number of fulltime teachers	Mentor : Mentee Ratio
564	255	1:2

## 2.4 – Teacher Profile and Quality

### 2.4.1 – Number of full time teachers appointed during the year

No. of sanctioned positions	No. of filled positions	Vacant positions	Positions filled during the current year	No. of faculty with Ph.D
342	258	84	13	255

### 2.4.2 – Honours and recognition received by teachers (received awards, recognition, fellowships at State, National, International level from Government, recognised bodies during the year )

Year of Award	Name of full time teachers receiving awards from state level, national level, international level	Designation	Name of the award, fellowship, received from Government or recognized bodies
2018	Roop Mallik (see the attachment for more entries)	Professor	Infosys Prize for Life Sciences, G. D. Birla award for scientific research

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## 2.5 – Evaluation Process and Reforms

### 2.5.1 – Number of days from the date of semester-end/ year- end examination till the declaration of results during the year

Programme Name	Programme Code	Semester/ year	Last date of the last semester-end/ year-end examination	Date of declaration of results of semester-end/ year- end examination
PhD or DPhil	PhD-Biol	August Semester	31/12/2018	16/01/2019

[View File](#)

### 2.5.2 – Average percentage of Student complaints/grievances about evaluation against total number appeared in the examinations during the year

Number of complaints or grievances about evaluation	Total number of students appeared in the examination	Percentage
Nil	379	0

## 2.6 – Student Performance and Learning Outcomes

2.6.1 – Program outcomes, program specific outcomes and course outcomes for all programs offered by the institution are stated and displayed in website of the institution (to provide the weblink)

[https://www.tifr.res.in/maincampus/deemed\\_university.php](https://www.tifr.res.in/maincampus/deemed_university.php)

2.6.2 – Pass percentage of students

Programme Code	Programme Name	Programme Specialization	Number of students appeared in the final year examination	Number of students passed in final year examination	Pass Percentage
PhD-Biol	PhD or DPhil	Biology	17	17	100
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## 2.7 – Student Satisfaction Survey

2.7.1 – Student Satisfaction Survey (SSS) on overall institutional performance (Institution may design the questionnaire) (results and details be provided as weblink)

NA

## CRITERION III – RESEARCH, INNOVATIONS AND EXTENSION

### 3.1 – Promotion of Research and Facilities

3.1.1 – Teachers awarded National/International fellowship for advanced studies/ research during the year

Type	Name of the teacher awarded the fellowship	Name of the award	Date of award	Awarding agency
National	Ujjwal Koley (see the attachment for more entries)	MATRICS Grant	01/08/2018	SERB
<a href="#">View File</a>				

3.1.2 – Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other fellows in the Institution enrolled during the year

Name of Research fellowship	Duration of the fellowship	Funding Agency
TIFR Research Scholarship (see the attachment for more entries)	1825	DAE
<a href="#">View File</a>		

### 3.2 – Resource Mobilization for Research

3.2.1 – Research funds sanctioned and received from various agencies, industry and other organisations

Nature of the Project	Duration	Name of the funding agency	Total grant sanctioned	Amount received during the year
Major Projects	1825	DAE	59050000	59050000
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### 3.3 – Innovation Ecosystem

3.3.1 – Workshops/Seminars Conducted on Intellectual Property Rights (IPR) and Industry-Academia Innovative practices during the year

Title of workshop/seminar	Name of the Dept.	Date
Workshop on How to Develop and Deliver an Effective Pitch	NCBS, Bengaluru	28/01/2019
A talk on 'Introduction to CARB-X-Funding opportunities for start-ups and Innovators	NCBS, Bengaluru	18/03/2019
National Workshop on Regulatory Compliance for Accelerating Innovations	NCBS, Bengaluru	09/04/2019
IP Clinic	TIFR-H, Hyderabad	02/01/2019
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### 3.3.2 – Awards for Innovation won by Institution/Teachers/Research scholars/Students during the year

Title of the innovation	Name of Awardee	Awarding Agency	Date of award	Category
Study on interaction of 1-alkyl-3-methylimidazolium chloride based ionic liquids with Triton X-114 micelles (see the attachment for more entries)	V. Avadhani and I. D. Sen	BARC Mumbai	08/12/2018	Best Poster Award
<a href="#">View File</a>				

### 3.3.3 – No. of Incubation centre created, start-ups incubated on campus during the year

Incubation Center	Name	Sponsored By	Name of the Start-up	Nature of Start-up	Date of Commencement
C-CAMP (see the attachment for more entries)	Bioincubator	BIRAC -Bio technology Ignition Grant for the initial 18 months and then various other/private funds	Rcupe Life Sciences	Ozyn-D Intraosseous Access Device	08/01/2019
<a href="#">View File</a>					

## 3.4 – Research Publications and Awards

### 3.4.1 – Ph. Ds awarded during the year

Name of the Department	Number of PhD's Awarded
National Centre for Radio Astrophysics	2
Centre for Applied Mathematics	3
International Centre for Theoretical	2

Sciences	
National Centre for Biological Sciences	12
Tata Institute of Fundamental Research, Hyderabad	2
Department of Astronomy and Astrophysics	2
Department of Biological Sciences	7
Department of Chemical Sciences	3
Department of Condensed Matter and Material Science	3
Department of High Energy Physics	1
Department of Nuclear and Atomic Physics	4
Department of Theoretical Physics	8
School of Mathematics	3
School of Technology and Computer Science	1
Homi Bhabha Centre for Science Education	3

#### 3.4.2 – Research Publications in the Journals notified on UGC website during the year

Type	Department	Number of Publication	Average Impact Factor (if any)
International	Department of Biological Sciences	26	0
<a href="#">View File</a>			

#### 3.4.3 – Books and Chapters in edited Volumes / Books published, and papers in National/International Conference Proceedings per Teacher during the year

Department	Number of Publication
Homi Bhabha Centre for Science Education (see the attachment for more entries)	4
<a href="#">View File</a>	

#### 3.4.4 – Patents published/awarded/applied during the year

Patent Details	Patent status	Patent Number	Date of Award
Novel Plasmodium protein as malarial vaccine and drug target Dated 17/06/2011 Application No. 1773/MUM/2011 (see the attachment for more entries)	Published	Indian Patent N	27/03/2019
<a href="#">View File</a>			

3.4.5 – Bibliometrics of the publications during the last academic year based on average citation index in Scopus/ Web of Science or PubMed/ Indian Citation Index

Title of the Paper	Name of Author	Title of journal	Year of publication	Citation Index	Institutional affiliation as mentioned in the publication	Number of citations excluding self citation
Simple smoothness indicator and multi-level adaptive order WENO scheme for hyperbolic conservation laws, (see the attachment for more entries)	Rakesh Kumar and Praveen Chandrashekar,	Journal of Computational Physics,	2018	0	Centre for Applied Mathematics, TIFR	Nil

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3.4.6 – h-Index of the Institutional Publications during the year. (based on Scopus/ Web of science)

Title of the Paper	Name of Author	Title of journal	Year of publication	h-index	Number of citations excluding self citation	Institutional affiliation as mentioned in the publication
Simple smoothness indicator and multi-level adaptive order WENO scheme for hyperbolic conservation laws, (see the attachment for more entries)	Rakesh Kumar and Praveen Chandrashekar,	Journal of Computational Physics,	2018	Nil	Nil	Centre for Applied Mathematics, TIFR

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3.4.7 – Faculty participation in Seminars/Conferences and Symposia during the year

Number of Faculty	International	National	State	Local
Attended/Seminars/Workshops	137	127	2	51
Presented papers	98	92	1	26
Resource persons	53	51	5	13

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### 3.5 – Consultancy

#### 3.5.1 – Revenue generated from Consultancy during the year

Name of the Consultan(s) department	Name of consultancy project	Consulting/Sponsoring Agency	Revenue generated (amount in rupees)
Department of Astronomy and Astrophysics	Imaging methods	Shell Technology Centre	15000000
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#### 3.5.2 – Revenue generated from Corporate Training by the institution during the year

Name of the Consultan(s) department	Title of the programme	Agency seeking / training	Revenue generated (amount in rupees)	Number of trainees
National Center for Biological Sciences (see the attachment for more entries)	Animal Model/Design, Management, Imaging and Flow Cytometry	Multiple Academic and Non Academic Institutions from India and Abroad	862000	73
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### 3.6 – Extension Activities

#### 3.6.1 – Number of extension and outreach programmes conducted in collaboration with industry, community and Non- Government Organisations through NSS/NCC/Red cross/Youth Red Cross (YRC) etc., during the year

Title of the activities	Organising unit/agency/ collaborating agency	Number of teachers participated in such activities	Number of students participated in such activities
Measurement of the largest pressure inside the proton (see the attachment for more entries)	Marathi Vigyan Parishad	1	Nil
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#### 3.6.2 – Awards and recognition received for extension activities from Government and other recognized bodies during the year

Name of the activity	Award/Recognition	Awarding Bodies	Number of students Benefited
The Connected Learning Initiative (CLIX) project of TISS, in which HBCSE is a collaborator. (see the attachment for more entries)	OER Collaboration Award for Excellence 2019, under the category tools, resources and practices.	Open Education Consortium	Nil
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#### 3.6.3 – Students participating in extension activities with Government Organisations, Non-Government Organisations and programmes such as Swachh Bharat, Aids Awareness, Gender Issue, etc. during the year

Name of the scheme	Organising unit/Agency/collaborating agency	Name of the activity	Number of teachers participated in such activities	Number of students participated in such activities
NA	NA	NA	Nil	Nil
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### 3.7 – Collaborations

3.7.1 – Number of Collaborative activities for research, faculty exchange, student exchange during the year

Nature of activity	Participant	Source of financial support	Duration
Genome editing collaborative grant from DBT (see the attachment for more entries)	Mahendra Sonawane, Chinmoy Patra, Aurnab Ghose, Tressa Jacob	DBT, India	5475
<a href="#">View File</a>			

3.7.2 – Linkages with institutions/industries for internship, on-the- job training, project work, sharing of research facilities etc. during the year

Nature of linkage	Title of the linkage	Name of the partnering institution/ industry /research lab with contact details	Duration From	Duration To	Participant
Reading Project (see the attachment for more entries)	CEBS-TIFR Joint Projects	CEBS, Mumbai	01/08/2018	31/07/2019	CS Rajan
<a href="#">View File</a>					

3.7.3 – MoUs signed with institutions of national, international importance, other universities, industries, corporate houses etc. during the year

Organisation	Date of MoU signed	Purpose/Activities	Number of students/teachers participated under MoUs
Raptor Research and Conservation Foundation (RRCF)- NCBS (see the attachment for more entries)	10/08/2018	For Grant entitled Understanding the diet of Critically Endangered Gyps vultures for conservation planning using molecular tools awarded to Umas student Mousumi.	2
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## CRITERION IV – INFRASTRUCTURE AND LEARNING RESOURCES

### 4.1 – Physical Facilities

#### 4.1.1 – Budget allocation, excluding salary for infrastructure augmentation during the year

Budget allocated for infrastructure augmentation	Budget utilized for infrastructure development
1573.46	1573.46

#### 4.1.2 – Details of augmentation in infrastructure facilities during the year

Facilities	Existing or Newly Added
Laboratories	Newly Added
Laboratories	Existing
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### 4.2 – Library as a Learning Resource

#### 4.2.1 – Library is automated {Integrated Library Management System (ILMS)}

Name of the ILMS software	Nature of automation (fully or partially)	Version	Year of automation
Libsys7	Fully	EJB, Rel 1.0	1990
KOHA	Fully	16.11.06.000	2014
KOHA	Fully	19.05.01.000	2018
Libsys	Fully	7	1995
KOHA	Fully	17.11.06.000	2016
NewGenLib	Partially	3.12	2016

#### 4.2.2 – Library Services

Library Service Type	Existing		Newly Added		Total	
Text Books	60981	27018212	1782	4420978	62763	31439190
<a href="#">View File</a>						

#### 4.2.3 – E-content developed by teachers such as: e-PG- Pathshala, CEC (under e-PG- Pathshala CEC (Under Graduate) SWAYAM other MOOCs platform NPTEL/NMEICT/any other Government initiatives & institutional (Learning Management System (LMS) etc

Name of the Teacher	Name of the Module	Platform on which module is developed	Date of launching e-content
Jayaram Chengalur (see the attachment for more entries)	Atomic Hydrogen in Galaxies	SWAYAM-ARPIT	01/11/2018
<a href="#">View File</a>			

### 4.3 – IT Infrastructure

#### 4.3.1 – Technology Upgradation (overall)

Type	Total Computers	Computer Lab	Internet	Browsing centers	Computer Centers	Office	Departments	Available Bandwidth (MBPS/GBPS)	Others
Existing	6319	791	2787	21	127	416	2971	4359	1993
Added	657	97	172	0	12	30	135	335	384
Total	6976	888	2959	21	139	446	3106	4694	2377



4.3.2 – Bandwidth available of internet connection in the Institution (Leased line)

4694 MBPS/ GBPS

4.3.3 – Facility for e-content

Name of the e-content development facility	Provide the link of the videos and media centre and recording facility
Tandberg MXP 1700	<a href="https://www.youtube.com/user/TIFRCAM">https://www.youtube.com/user/TIFRCAM</a>
Tandberg MXP 6000	<a href="https://www.facebook.com/TIFRCAM">https://www.facebook.com/TIFRCAM</a>
LifeSize Room 220	<a href="https://www.youtube.com/user/TIFRCAM">https://www.youtube.com/user/TIFRCAM</a>
Lifesize UVC Video center, OBS (Open Broadcaster Software), Lifesize Codec, Filmora video editor, Adobe Suite, Final cut pro video editor, iMovies, YouTube editor etc	<a href="https://www.youtube.com/ictstalks">https://www.youtube.com/ictstalks</a>
Multimedia Production Team	<a href="https://www.youtube.com/channel/UCBoz08Kb4GiVIanFv8VUwmq">https://www.youtube.com/channel/UCBoz08Kb4GiVIanFv8VUwmq</a>

4.4 – Maintenance of Campus Infrastructure

4.4.1 – Expenditure incurred on maintenance of physical facilities and academic support facilities, excluding salary component, during the year

Assigned Budget on academic facilities	Expenditure incurred on maintenance of academic facilities	Assigned budget on physical facilities	Expenditure incurred on maintenance of physical facilities
1704.65	1704.65	7591.94	7591.94

4.4.2 – Procedures and policies for maintaining and utilizing physical, academic and support facilities - laboratory, library, sports complex, computers, classrooms etc. (maximum 500 words) (information to be available in institutional Website, provide link)

TIFR has different dedicated sections that help in the maintenance and utilization of academic, physical, and support facilities that help in smooth operations of its research as well as teaching. The physical infrastructure such as buildings, power supply, air-conditioning, and ventilation, water supply is looked after by the Technical Services (TSR) section. Similar technical committees are present in all the off campuses at Mumbai, Pune, Bengaluru, and Hyderabad. For building sophisticated scientific equipment there is a dedicated Central Workshop (CWK) apart from smaller workshops in different academic departments. The Central Workshop is equipped with precision fabrication facilities including several computer-controlled CNC machines. There is also a separate Low-Temperature facility (LTF) that provides cryogenic liquids (helium and nitrogen) for scientific experiments to all users in the institute. The state-of-the-art equipment present in all the campuses are maintained by specific academic departments but are available for all users across the institute. The advanced equipment for research and education is maintained by a 100-strong highly skilled permanent scientific personnel attached to various departments. For all the departments on the main campus, TIFR provides common computing facilities through its Computer Centre and Communication Facilities (CCCF). It hosts an email server, web-server, High-performance computing (HPC), and several workstations. It also provides seamless WiFi connectivity throughout the campus. The section also supervises the activities of Lecture Theater and Auditorium given the increasing importance of ICT in organizing lectures/seminars/virtual meetings over the internet. Similar facilities are also available at each of the campuses. For any technical work to be carried out by the centralized technical team, an

institute member can make an online request through the DataNet, a dedicated centralized management portal which has been developed in-house. Laboratory space is allocated by the Space Allocation Committee, which keeps track of the needs of the Departments and their research programs for space. The space for laboratory and offices are allocated based on scientific merit and equitable distribution. Upon the retirement of a faculty member or the winding up of a laboratory, space is returned to the committee for further allocation. This ensures efficient utilization of space. The Main Campus has a gymnasium, indoor badminton court, Yoga rooms, and two large playgrounds for football /cricket athletics. These facilities are maintained by the TIFR Sports Club. Similarly, the hostel, canteen, and other facilities are looked after by the respective committees comprised of representations from faculties, administrative, technical, and scientific staff as well as students. Similar arrangements are also in place at all the off campuses.

<https://main.tifr.res.in/>

## CRITERION V – STUDENT SUPPORT AND PROGRESSION

### 5.1 – Student Support

#### 5.1.1 – Scholarships and Financial Support

	Name/Title of the scheme	Number of students	Amount in Rupees
Financial Support from institution	Research Fellowship	564	208440000
Financial Support from Other Sources			
a) National	DBT / CTEP (see the attachment for more entries)	2	197000
b)International	EMBO Travel Grant (see the attachment for more entries)	2	100000

[View File](#)

#### 5.1.2 – Number of capability enhancement and development schemes such as Soft skill development, Remedial coaching, Language lab, Bridge courses, Yoga, Meditation, Personal Counselling and Mentoring etc.,

Name of the capability enhancement scheme	Date of implemetation	Number of students enrolled	Agencies involved
Yoga Session (see the attachment for more entries)	11/10/2018	30	IAIM Healthcare Centre

[View File](#)

#### 5.1.3 – Students benefited by guidance for competitive examinations and career counselling offered by the institution during the year

Year	Name of the scheme	Number of benefited students for competitive examination	Number of benefited students by career counseling activities	Number of students who have passed in the comp. exam	Number of students placed
2018	NA	Nil	Nil	Nil	Nil

No file uploaded.

5.1.4 – Institutional mechanism for transparency, timely redressal of student grievances, Prevention of sexual harassment and ragging cases during the year

Total grievances received	Number of grievances redressed	Avg. number of days for grievance redressal
8	7	80

## 5.2 – Student Progression

5.2.1 – Details of campus placement during the year

On campus			Off campus		
Name of organizations visited	Number of students participated	Number of students placed	Name of organizations visited	Number of students participated	Number of students placed
NA	Nil	Nil	NA	Nil	Nil
No file uploaded.					

5.2.2 – Student progression to higher education in percentage during the year

Year	Number of students enrolling into higher education	Programme graduated from	Department graduated from	Name of institution joined	Name of programme admitted to
2018	6	PhD	Department of Biological Sciences	University of Zurich, University of Minnesota, Sainsbury-Wellcome Centre Stanford University University of Warwick	Post-Doctoral Research
<a href="#">View File</a>					

5.2.3 – Students qualifying in state/ national/ international level examinations during the year (eg:NET/SET/SLET/GATE/GMAT/CAT/GRE/TOFEL/Civil Services/State Government Services)

Items	Number of students selected/ qualifying
NET	2
No file uploaded.	

5.2.4 – Sports and cultural activities / competitions organised at the institution level during the year

Activity	Level	Number of Participants
Founders Day Sports Tournaments, Main Campus (see the attachment for more entries)	In-house	250
<a href="#">View File</a>		

## 5.3 – Student Participation and Activities

5.3.1 – Number of awards/medals for outstanding performance in sports/cultural activities at national/international level (award for a team event should be counted as one)

Year	Name of the award/medal	National/ International	Number of awards for Sports	Number of awards for Cultural	Student ID number	Name of the student
2018	NA	National	Nil	Nil	NA	NA
No file uploaded.						

5.3.2 – Activity of Student Council & representation of students on academic & administrative bodies/committees of the institution (maximum 500 words)

TIFR Students Society (TSS) on the Main Campus is an elected student body that serves as a point of contact between the students and the institute administration. The elected members of TSS (a sports secretary, a canteen secretary, a hostel secretary, a cultural secretary, a library in-charge and a mov.in-charge) look after the maintenance of students hostels and also supervise day-to-day operations of the students canteen in TIFR residential colony. Apart from that, TSS monitors library facilities in the institute and also organizes numerous recreational and cultural activities for students. It arranges private screening of movies every week. TSS holds annual sports tournament for Football, Volleyball, Cricket, Badminton, Chess, Table Tennis, etc., and promotes cultural events like celebrations of various festivities, Freshers party, Music events, Student-faculty interaction dinner, etc. Students contribute to most of these activities although TIFR supports some activities that deal with the improvement of infrastructure. HBCSE also has a Students' committee, consisting of three members selected by the students and appointed by the Centre Director, which liaises with the faculty and administration to resolve student-related issues. In HBCSE, the Annual Research Meet is an informal and supportive forum for presentation, discussion, sharing, and debate over academic research which is organized entirely by Research Scholars. In TIFR-H, to encourage the students to take part in fields other than science, cultural colloquiums, sports are arranged and the respective committees comprise mostly the students apart from some representatives from faculty and administration. TIFR has student representation on • Canteen Committee, Science Popularization and Public Outreach Committee, Founder's Day Committee at TIFR Colaba • Canteen Committee, Sports Committee, Library Committee, Hostel Committee at HBCSE • The Hostel Committee, Library Committee, Canteen Committee, and Computer Facilities Committee at NCRA • Canteen Committee at CAM • Campus Services Cell (looking after issues related to the canteen, Fitness centre, Health Promotion Centre, safety issues and Transport), Sports and Recreation Committee, and Cultural Committee, Cell for Prevention and Resolution of Sexual Harassment of Women at Workplace, Transport Security Committee, Cafeteria Canteen Committee, Childcare cell, Women cell, Medical Committee, ICTS Annual Symposium at ICTS • Academic Affairs Committee, Canteen and Recreation Committee, Hostel Committee, Internal Complaints Committee at TIFR-H.

## 5.4 – Alumni Engagement

5.4.1 – Whether the institution has registered Alumni Association?

Yes

TIFR Alumni is registered as a Society. It was formally established on April 29, 2000. The Institute has already received crucial support from its members towards fulfilling its main objectives. It has become one of the most important driving forces for the 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. The day to day affairs of TAA is managed by an Executive Committee. It conducts lectures of public interest which is open to all. It also actively partners

with the TIFR Endowment Fund to institute awards to students and members of TIFR. An annual e-newsletter is published and distributed to all its members via email. Efforts are on to enrol new members and take up additional activities to further the interest of its parent institute, Tata Institute of Fundamental Research.

5.4.2 – No. of registered Alumni:

514

5.4.3 – Alumni contribution during the year (in Rupees) :

0

5.4.4 – Meetings/activities organized by Alumni Association :

Awards for Faculties and Students Award in Science Education - Given to any serving or past member (still active in the field of Science Education) of the institute - biennially Prof. Sukumar Biswas Ph.D. Student Award - a yearly award given to students pursuing a Ph.D. in physics Shri Ramakrishna Cowsik Medal and Smt. Saraswathi Cowsik Medals - given to a regular or past member for contributions to an outstanding research paper - Yearly TAA Excellence Award - given to a faculty member for outstanding work in his/her field - Yearly TAA Patent Award - given to a member for contribution to outstanding work in applied science TAA Zita Lobo Memorial Award - Given to a non-academic member of the Department of Biological Sciences for outstanding supportive work TAA Excellence in Teaching Award - given to a faculty member for excellence in teaching and guiding Ph.D. Students - Yearly TAA Geeta Udgaonkar Award - given to a Ph.D. student for the best thesis in Physics - Yearly TAA harish Chandra Memorial Award - given to a Ph.D. student for the best Ph.D. thesis in mathematics or computer sciences TAA Zita Lobo Award - given to a student of the Department of Biological Sciences for the best Ph.D. thesis - Yearly TAA Sasken Award - Given to a student for the best Ph.D. Thesis in Technology and Computer Sciences - Yearly TAA B. M. Udgaonkar Award - given to a Ph.D. student for the best thesis in Science Education - Biennially. Public Lectures: National Science Day Lecture on Persuading immunity to keep acting against cancers Nobel pros and cons - Prof Satyajith Rath: February 28, 2019 JRD Tata Memorial Lecture on Economic growth and inequality - Dr. Ajit Ranade: July 29, 2019

## **CRITERION VI – GOVERNANCE, LEADERSHIP AND MANAGEMENT**

### **6.1 – Institutional Vision and Leadership**

6.1.1 – Mention two practices of decentralization and participative management during the last year (maximum 500 words)

1. The Scientific Information Resource Center of the institute on the Main Campus houses books, journals in the hard copy format as well as the electronic format. The library staff is generally responsible for running this facility during office hours. However, beyond office hours this facility is kept functional by the students. Students assign duties among themselves and take charge of the library and keep it functional till midnight during weekdays and till late night on holidays. During these after office hours, the student in-charge is responsible for maintaining the library premises functional for the institute members, issue and accept returned books, and appropriately keep them in the library office so that the library staff can handle them appropriately on the next working day. 2. TIFR Houses the High Field NMR National Facility and the institute has constituted the NMR Management Advisory Committee which has members from TIFR Mumbai and TIFR Hyderabad along with external members along with the representatives from DST, DBT, and CSIR. This committee concerns itself with the overall management of the National Facility for High Field NMR

and formulation of academic programmes and policies for developing the Facility as an outstanding research establishment.

6.1.2 – Does the institution have a Management Information System (MIS)?

Yes

## 6.2 – Strategy Development and Deployment

6.2.1 – Quality improvement strategies adopted by the institution for each of the following (with in 100 words each):

Strategy Type	Details
Curriculum Development	<p>TIFR selects its students via a nationwide competitive examination followed by interviews, for which more than 20000 students appear every year. As a result, we get very good students, and our challenge is to make them even better and to help them develop their latent scientific talent so that they become comparable to their peers in the best universities across the world. From the teaching perspective, this involves keeping a continuous tab of new developments in the subjects and going on modifying our course contents in their light. Besides this continuous development, every few years the various Subject Boards revisit their syllabi and update them. We also introduce graduate students to the research groups in the institute working in the frontline areas of research in the form of lab visits and semester-long projects. This helps in molding their scientific talent to absorb the ways of doing frontline scientific research.</p>
Teaching and Learning	<p>From the learning perspective, the TIFR endeavors to provide an enabling environment to our students, which is rich in intellectual stimulation, and at the same time has enough interaction with scientists in the area and supervision and feedback by the teachers. The time they spend in the excellent library and laboratories that we have built over the years are of great help to the students to learn their discipline, in conjunction with our formal courses and examinations. We always try to bring a sense of creative play to all our teaching/learning interactions. Short laboratory orientations and semester-long projects are part of these efforts where students are introduced to the ways of carrying out the front line scientific research. This also helps students get</p>

familiar with the research area closest to their choice.

Examination and Evaluation

The rules for extensions of students were formalized, in the background of the increase in the student fellowships and restriction on the time that be taken for Ph.D. The coursework related rules for Ph.D. registration are strictly adhered to.

Research and Development

Each faculty of the institute is encouraged to apply for grants to fund their research activities. This includes the periodic plan proposals to the Department of Atomic Energy. These proposals are vetted at the institute level before their submission to the funding agencies. Moreover, a periodic review is carried out for various departments and centers where the external subject experts' committee comprised of the world-renowned scientists visits the institute and interacts with the institute members, and gives a detailed assessment of the activities of the departments. Institute strongly encourages collaborations and research visits by the members.

Library, ICT and Physical Infrastructure / Instrumentation

The library committee oversees the functioning of the library, and a computer committee oversees the ICT infrastructure. Continuous efforts are made to expand access to online journals as well as the book collection. Members are encouraged to suggest new reference books and textbooks be added to the existing collection. Efforts are made to connect all the libraries across various centres of TIFR via VPN. The computer committee is responsible for the upgrade of the ICT infrastructure both in terms of hardware and software. Campus-wide WiFi connectivity is also implemented on all the campuses. Video conferencing units are added for remote meeting organization.

Human Resource Management

Our recruitment of the faculty entirely focuses on the research achievements and scholarship of the candidates. This way, we are able to recruit the best scientific manpower in the country, and also the cream of returning young Indian scientists who have been awarded their Ph.Ds or postdoctoral fellowships abroad. TIFR

follows the Tenure Track system for the young faculty members joining the institute. Once a young faculty member joins TIFR, he/she begins to take part in the nurture of students, and by and by assumes more responsibilities including lecturing and being the formal guide of a student. Thus, our faculty members begin as excellent scientists and then grow into the role of active and enthusiastic teachers. Besides the Faculty, we have a large support staff. Our policy is to treat them as partners in our larger aims and to encourage them to take responsibility, to make innovations, and to grow with the job.

Industry Interaction / Collaboration

There have been some research projects funded by the industry, and some industries have formal MoUs with TIFR that facilitate collaborations. Internships of people from the industry in TIFR, and access to industry-level technology to TIFR members, has been of mutual benefit.

Admission of Students

The additional written test was introduced by the Subject Board of Physics in the selection process of the research scholar at the Main Campus. This written test is comprised of descriptive problem-solving questions and the candidates shortlisted for the interviews were asked to give this test. The result of the test was used to further filter the candidates for the interviews.

6.2.2 – Implementation of e-governance in areas of operations:

E-governance area	Details
<p>Planning and Development</p>	<p>TIFR has an internal Information Systems Development Group, with dedicated staff. The ISDG looks after the information technology requirements and plan of execution for the Institute, developing online procedures for various academic, administrative, and financial processes in the Institute, including the Colaba campus and the Centres and Field Stations. The ISDG works in close collaboration with the relevant Sections of the Institute, adapting existent systems for online functioning and developing new procedures, if necessary to facilitate these.</p>
<p>Administration</p>	<p>The movement of files with approval</p>



from authorities at successively higher levels is gradually being moved to Datanet and LDAP, though the process is not complete. This includes applications, such as leave, reimbursement, LTC applications, etc. On the financial side, the tendering process is now largely electronic. Most bookings of rooms, accommodation, transport, canteen facilities, photographic cell, etc. are now done electronically. Bidding for residential accommodation in Institute quarters is done purely electronically.

**Finance and Accounts**

TIFR has built its own Integrated Information System (TIIS), which is an integrated Enterprise Resource Planning (ERP) solution for TIFR which includes Personal Information System, Payroll, Pension, Provident Fund, Procurements, Material Receipts, Inventory, Budget, Accounting, Finance, and Accommodation. TIIS was implemented at TIFR Main Campus and has been implemented on other campuses except one. In addition to TIIS, Datanet provides information to staff members on their desktops, on e.g. service record, salary, purchase orders, indent status, etc. Financial transactions of some of the government departments are done through the PFMS software.

**Student Admission and Support**

The nationwide written entrance test of TIFR, GS2019, was made computer-based this year. It was conducted with the help of Tata Consulting Services in multiple Centres (more than 30) across India. The process includes the online application process, generation of the hall tickets, conducting the online written test for all the subjects, evaluating the results based on the answers keys provided, preparing the results, and also the relevant statistics and archiving the records for any queries in the future. The overall experience was very positive and it is planned to continue with the computer-based tests in the future.

**Examination**

Since the student to faculty ratio is very small pan-TIFR, the need for adopting e-governance has not been felt so far.

**6.3 – Faculty Empowerment Strategies**

6.3.1 – Teachers provided with financial support to attend conferences / workshops and towards membership fee of professional bodies during the year

Year	Name of Teacher	Name of conference/ workshop attended for which financial support provided	Name of the professional body for which membership fee is provided	Amount of support
2018	Krishanu Ray (see the attachment for more entries)	EMBO/ASCB Annual Meeting Dec 7 to 12	NA	225221
<a href="#">View File</a>				

6.3.2 – Number of professional development / administrative training programmes organized by the University for teaching and non teaching staff during the year

Year	Title of the professional development programme organised for teaching staff	Title of the administrative training programme organised for non-teaching staff	From date	To Date	Number of participants (Teaching staff)	Number of participants (non-teaching staff)
2019	NA	Administ rative Training (see the attachment for more entries)	12/04/2019	15/04/2019	Nil	44
<a href="#">View File</a>						

6.3.3 – No. of teachers attending professional development programmes, viz., Orientation Programme, Refresher Course, Short Term Course, Faculty Development Programmes during the year

Title of the professional development programme	Number of teachers who attended	From Date	To date	Duration
NA	Nil	01/08/2018	01/08/2018	0
No file uploaded.				

6.3.4 – Faculty and Staff recruitment (no. for permanent recruitment):

Teaching		Non-teaching	
Permanent	Full Time	Permanent	Full Time
13	Nil	18	Nil

6.3.5 – Welfare schemes for

Teaching	Non-teaching	Students
All permanent teachers and their dependents are members of a Contributory Health Services Scheme (CHSS) which provides medical support. This access is also extended to the retired members. A free annual medical	All permanent non-teaching staff members and their dependents are members of a Contributory Health Services Scheme (CHSS) which provides medical support. This access is also extended to the retired members. A	Students are provided with the free medical facilities that are existing in the institute. Main Campus: The students have access to a select panel of specialists from the city of Mumbai for medical

checkup is provided to all the teachers. Apart from this, the following activities were taken up towards the welfare of the teaching staff in the institute: Main Campus: • Organized Typhoid vaccination camp • Conducted lectures on Consumer rights HBCSE: All teaching staff has access to the community centre in neighbouring Anushaktinagar with a swimming pool and other facilities. ICTS: • Sports initiatives like Marshal Art training for students and staff members. • Health screening camps being arranged periodically. TIFRH: • Fully equipped Gymnasium is made available for all the teaching staff members • TIFR Employee's Cooperative Credit Society provides welfare schemes that are operated as an educational loan, Personal loan, Home loan, etc. • General Physician visit is organized twice a week and the Psychiatrist Consultation is provided whenever required.

free annual medical checkup is provided to all the teachers. Apart from the following activities were taken up towards the welfare of the teaching staff in the institute: Main Campus: • Organized Typhoid vaccination camp • Conducted lectures on Consumer rights • Provided partial support for the blood donation camp in the Institute. HBSCE: All non-teaching staff has access to the community centre in neighbouring Anushaktinagar with a swimming pool and other facilities. ICTS: • Sports initiatives like Marshal Art training for students and staff members. • Health screening camps being arranged periodically. TIFRH: • Fully equipped Gymnasium is made available for all the non-teaching staff members • TIFR Employee's Cooperative Credit Society provides welfare schemes are operated like the educational loan, Personal loan, Home loan, etc. • General Physician visit is organized twice a week and the Psychiatrist Consultation is provided whenever required.

treatments with subsidized fees. Financial help towards medical treatment is also provided on a case by case basis. Students have access to the recreation center on the campus. HBCSE: Students have free medical care for OPD and hospitalization. They have access to sports and gym facilities on campus. NCRA: All students are enrolled in the institute medical scheme CAM: The students are covered via a separate health insurance scheme that is fully paid from the centres budget. In addition, a GP is made available for consultation on campus two times a week. ICTS: • Health insurance scheme for all the students in which there is a provision of general OPD facilities and Annual Health Check-up without any waiting period. • Sports initiatives like Marshal Art training for students and staff members. • Health screening camps being arranged periodically. NCBS: Students are covered under the Group Mediclaim policy wherein inpatient treatment up to Rs. 3 lakh is covered. TIFRH: • Fully equipped Gymnasium is made available for all the students • Sports and recreational activities are organized throughout the year • General Physician visit is organized twice a week and the Psychiatrist Consultation is provided whenever required.

## 6.4 – Financial Management and Resource Mobilization

6.4.1 – Institution conducts internal and external financial audits regularly (with in 100 words each)

The Institute has its pre-audit cell for internal financial audits. The Statutory Auditors, appointed with the approval of the Council of Management of TIFR perform half-yearly as well as a yearly financial audit. M/s. G D. Apte and Company has performed the audit work of the Institute from F.Y. 2017-18. The Statutory auditor visits every Center F.S yearly as well as a half-yearly audit. Additionally, the Internal Inspection Wing (IIW) of the Department of Atomic Energy conducts an annual audit of the Institute. Moreover, a team of Auditors of Comptroller and Auditor General of India also conducts the annual audit.

6.4.2 – Funds / Grants received from management, non-government bodies, individuals, philanthropies during the year(not covered in Criterion III)

Name of the non government funding agencies /individuals	Funds/ Grnats received in Rs.	Purpose
INFOSYS, TIFR ALUMINI ASSOCIATION ETC.	6932000	ENDOWMENT, AWARD
No file uploaded.		

6.4.3 – Total corpus fund generated

0
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### 6.5 – Internal Quality Assurance System

6.5.1 – Whether Academic and Administrative Audit (AAA) has been done?

Audit Type	External		Internal	
	Yes/No	Agency	Yes/No	Authority
Academic	No	Null	Yes	International Review Committee through Director TIFR
Administrative	No	Null	No	Null

6.5.2 – What efforts are made by the University to promote autonomy in the affiliated/constituent colleges? (if applicable)

Not applicable as there are no affiliated colleges
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6.5.3 – Activities and support from the Parent – Teacher Association (at least three)

As the TIFR Graduate School caters to only post Graduate students, the institute does not have a Parent-Teacher Association.
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6.5.4 – Development programmes for support staff (at least three)

1. The institute organized an Intensive Training Fire Prevention Fire Fighting programme for the security staff from June to November 2018 for better preparation to handle related emergencies. 2. Administrative Training was organised for the support staff with the help of instructors from DAE
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6.5.5 – Post Accreditation initiative(s) (mention at least three)

1. The nationwide written entrance test of TIFR, GS2019, was made computer-based this year. It was conducted with the help of Tata Consulting Services in all the Centres (more than 30), and the experience was very positive for all the Subject Boards involved (Physics, Chemistry, Biology, Mathematics, CSS). It is planned to continue with the computer-based tests even in the future. 2. The online module for Visiting Students Research Programme (VSRP) which is
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conducted in summer, for selections, has now been developed in-house in TIFR Colaba and will be used for the 2019 VSRP program. Earlier, software developed by an external agency was being used. 3. Funds were raised for travel expenses of students from external philanthropic sources for example the Sarojini Damodaran Fellowships for the travel of students abroad for collaborations and conferences, as well as for inviting eminent visitors to TIFR.

#### 6.5.6 – Internal Quality Assurance System Details

a) Submission of Data for AISHE portal	Yes
b) Participation in NIRF	Yes
c) ISO certification	No
d) NBA or any other quality audit	No

#### 6.5.7 – Number of Quality Initiatives undertaken during the year

Year	Name of quality initiative by IQAC	Date of conducting IQAC	Duration From	Duration To	Number of participants
2018	Computerised nationwide written test for admissions (see the attachment for more entries)	15/02/2019	09/12/2018	09/12/2018	21787

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### CRITERION VII – INSTITUTIONAL VALUES AND BEST PRACTICES

#### 7.1 – Institutional Values and Social Responsibilities

7.1.1 – Gender Equity (Number of gender equity promotion programmes organized by the institution during the year)

Title of the programme	Period from	Period To	Number of Participants	
			Female	Male
"Poster Exhibition on the topics: 1. #Me too movement in India 2. #Me too movement in India and harassment at workplace 3. #Me too movement and role of women's cell (HBCSE)"	07/10/2018	07/10/2018	100	100
"A Public Talk by Sameera Khan on ""What Women Want:"	08/03/2019	08/03/2019	50	50



	advantages and disadvantages	and contribute to local community					
2018	Nil	Nil	01/08/2018	0	NA	NA	Nil
No file uploaded.							

#### 7.1.5 – Human Values and Professional Ethics Code of conduct (handbooks) for various stakeholders

Title	Date of publication	Follow up(max 100 words)
Guidelines on Academic Ethics	01/08/2018	The guidelines on academic ethics were released on 4th June 2012. The link to the guidelines is made available on the institute website (Weblink: <a href="https://www.tifrr.res.in/webdocs/TIFR-doc-ETHICS.pdf">https://www.tifrr.res.in/webdocs/TIFR-doc-ETHICS.pdf</a> ). Besides, every year, the new batch of research scholars who take admission to the institute programmes are made familiarised with these guidelines and a special orientation is carried out which is also a part of the research methodology course in graduate school.

#### 7.1.6 – Activities conducted for promotion of universal Values and Ethics

Activity	Duration From	Duration To	Number of participants
Sadbhavana Diwas (see the attachment for more entries)	19/08/2018	19/08/2018	1032
<a href="#">View File</a>			

#### 7.1.7 – Initiatives taken by the institution to make the campus eco-friendly (at least five)

<p>1. In the NCBS Campus, the water audit was carried out and potential areas were identified and meters provided for monitoring. Lab coolant water is diverted back to the main tank for reuse. 2. Optimizing consolidating the run of Autoclave machines were done to reduce the energy consumption in the NCBS Campus 3. Addition of 10 kW On-Grid Solar Panel at the car parking rooftop in the ICTS Campus. 4. Vertical gardens were erected on the walls of the institute guest house and one of the hostels in the Main Campus 5. At the NCRA campus a composting machine is bought and the segregation of the collected garbage has been streamlined and the recycling of plastic has been started on the campus. 6. In the HBCSE Campus, waste segregation was made mandatory and Rotary-Drum composting was initiated 7. In the HBSCE Campus, around 900kgs of compost was produced from the centres kitchen and garden waste, and over 30 species of edible plants were successfully grown on the campus urban farm</p>
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#### 7.2 – Best Practices

## 7.2.1 – Describe at least two institutional best practices

Best Practice 1: Regular independent international reviews of research activities of Departments/Centres

1. Title of the Practice Regular independent international reviews of research activities of Departments/Centres

2. Objectives of the Practice The objective of the international peer review is to evaluate the performance of the department/centre vis a vis similar research units across the world. The basic principle is to have an independent external committee that is composed of leading experts in the field from across the world review the performance of the unit (across all metrics, including student training, quality and impact of research, etc.). Rather than focussing on quantitative metrics alone, the review committees are encouraged to conduct thorough reviews which take several months and include detailed inputs from faculty, staff and students. The outcome is to identify strengths and weaknesses, to prioritize research areas, and to ensure scientific excellence.

3. The Context or challenging issues Given TIFR's excellent standing internationally, there were no major challenges in designing and implementing this practice. Leading experts from across the world have generally been willing to put in the effort to do a detailed review and have provided insightful and useful suggestions regarding the way forward. However, since TIFR is a large multidisciplinary research institution, with its Departments and Centres operate within their own unique context, care has to be taken to set the terms of reference carefully for each unit, to accommodate the unit's specific character, while at the same time ensuring that the overall review process across TIFR adheres to consistent and high standards.

4. The Practice Review panels are appointed by the Director TIFR. The review panel is provided with extensive reports on the department, including details of student and teaching related issues, research, profiles of each member, management structure, plans for the future etc. prior to their visit. During the visit the panel also has detailed discussions with all sections of the department/centre. Following this, the committee submits a confidential report to the Director. At each stage the integrity of the process is maintained by removing or addressing any potential conflicts of interest, and ensuring confidentiality of the final reports. This allows the committee to be candid, and provide both positive and negative feedback. Such detailed reviews are highly unusual in the context of Indian higher education organizations. In general these institutions are reviewed only during an accreditation or some such similar process. A review which does not lead to any formal certification is very unusual. Nor is it common for an Indian institution to be reviewed against international yardsticks. As mentioned above there have not been any major constraints or limitations in carrying out this process.

5. Evidence of Success The success of this process is demonstrated by multiple lines of evidence: (a) that international research leaders are willing to provide a significant amount of time to participate in the process (b) that the process has now gone on for multiple decades (c) that the committee recommendations have been used to make important changes to the research practices of Departments and Centres (d) that TIFR's international reputation for excellence in student training and research has been maintained for the last several decades.

6. Problems Encountered and Resources Required No major problems have been encountered, and the resources required are modest. However such reviews do require substantial investment of time and manpower on the part of TIFR. It is important that reviews are initiated and completed in a timely manner, as the comments must be kept up-to-date relative to the rapid movement of each scientific discipline. By its very nature this process is time consuming, both for the committee as well as the department. It must be supported by efficient administrative staff, confidential processes, rapid response times to any committee requests. This requires the institution to plan years in advance and dedicate appropriate resources and manpower to the process.

7. Notes (Optional) None

Best Practice



2: TIFR Frontiers of Science 1. Title of the Practice TIFR Frontiers of Science

2. Objectives of the Practice The annual "Frontiers of Science" programme, provides a unique opportunity for 9th/10th standard students and teachers from selected schools to visit TIFR on a Sunday, for an interesting mix of laboratory visits, engaging lectures and science demonstrations. A wide cross section of schools, especially those from a rural or under-served background are invited to this inclusive event. 3. The Context The Science Popularization and Public Outreach Committee (SPPOC) of TIFR endeavours to convey the exciting developments in science and technology to the general public with a special emphasis on showcasing research being done in TIFR. An important focus of this effort is to reach out to school/college students and teachers, especially in under-served communities, and to inspire students to pursue a career in basic sciences. A major problem is that most high-school students have almost no exposure to the real-world research environment. At best, they are limited to the experience of their school laboratory. In most schools, the science laboratory class, if it exists, is a routine boring ritual that does not excite students about science. Unfortunately, students have to choose an academic stream after class X, and many of them drop science. Hence, an effort to showcase modern research labs to a high school audience and permit them to engage with young researchers is important. 4. The Practice The Frontiers of Science event is specially curated event specifically aimed at high school students, with a carefully chosen combination of visits to many of TIFR's state-of-the-art research laboratories and facilities, lectures by graduate students, and exciting science demonstrations. A key feature of FoS is that it is mainly a student managed event, with a lot of interaction between the TIFR graduate students and the visitors. The visiting groups are welcomed and guided through the day, and through the campus by students, the lectures/demonstrations are mainly given by students, and in most labs, the visits are also conducted by student researchers. This engagement with young ambassadors of TIFR's science significantly encourages interaction and questions without the typical inhibition of open discussions with older teachers that is often seen in school students. In recent years, about 40 labs and facilities are open for visits. Each visiting group gets to visit 3-4 labs, listen to two lectures on different topics in mathematics and science by students, attend a "How to become a scientist?" talk by a young faculty member, and participate in an interactive science demonstration. The selection of speakers, local hosts for each visiting group, volunteers for demonstrations etc. is carefully done to ensure an equitable gender balance in all the activities. We also ensure a gender balance in the students invited for the programme. A key feature of our programme is the inclusion of schools from various locations across Mumbai, both English and vernacular medium, as well as from schools from under-served rural areas, e.g. FoS 2019 saw representation from talukas like Niphad, Mangaon, Shahapur, Wada, Sillod, Paithan, Shirvardhan, Bhiwandi, Palghar etc. Apart from traditional school groups, we also invite students in the local community - e.g. children of employees in the local police station, fire brigade, post office, banks etc. as well as those of our own employees. 5. Evidence of Success The requests for participation at FoS have steadily increased over the years, and we have expanded from a small exploratory programme with only about 100 students in 2003 to an large event with 2400 visitors in 2019 with multiple batches of students participating in different activities in parallel. This growth is summarized below.

Year	Visitors
2010	650
2011	760
2012	760
2013	1400
2014	1400
2015	1500
2016	1700
2017	1700
2018	2100
2019	2400

A key aspect that has helped us fine-tune the programme is the detailed feedback, both quantitative metrics and qualitative evaluation that is sought from the participants. This is routinely analysed to identify areas of improvement for future editions of the programme. 6. Problems Encountered and Resources Required Over the years we have encountered several problems, mostly logistical, that have been tackled to manage an event of this scale

successfully. 1.Ensuring equity and diversity: Making sure there is a representation of schools across the geography of the city, ensuring that the different schools get a chance each year, different language mediums are represented, almost equal number of boys and girls attend the programme. A good database is needed. 2.Ensuring that the level of explanation in labs and lectures is suitable for the 9/10th standard level. Requires significant mentoring in scientific outreach and public speaking skills etc. 3.Arranging for logistics of 2000 visitors on a single day. From transport arrangements from local train stations to the adequate availability of rest-rooms or trash cans on campus. 7. Notes (Optional) Our experience has shown that given some effort and mentoring, even the most complex experimental setups can be made accessible to high school students and the ability to engage with real scientists-in-the-making and practicing researchers is an enriching and inspiring experience for most students.

Upload details of two best practices successfully implemented by the institution as per NAAC format in your institution website, provide the link

<https://www.tifr.res.in/NAAC/TIFRBestPractices2018-19.pdf>

### 7.3 – Institutional Distinctiveness

7.3.1 – Provide the details of the performance of the institution in one area distinctive to its vision, priority and thrust in not more than 500 words

The Giant Metrewave Radio Telescope is a large facility built and operated by the National Centre of Radio Physics of the Tata Institute of Fundamental Research. Consisting of 30 antennas, each 45m in diameter it is a world-class observatory and the most sensitive radio telescope in the world at many of its frequencies of operation. Signals from each of the GMRT antennas are transported to a central electronics building via optical fibre where they are combined using sophisticated electronics to allow the entire array to operate as a single telescope and image the sky with the resolution corresponding to that of a 25 km sized mirror. The electronics also allows the signals from the telescopes to be combined to provide a very high time resolution data stream, which is useful to observe short-duration radio bursts from cosmic radio sources, such as pulsars. The GMRT has just completed a major upgrade that provides broadband, almost seamless frequency coverage from 100 to 1500 MHz with improved sensitivity receivers. Along with this, the maximum instantaneous bandwidth has been increased by more than a factor of 10, from 32 MHz to 400 MHz. This results in both higher fidelity images as well as a significant improvement in sensitivity. Almost all of the components of the telescope have been upgraded to use modern, state of the art technology. This includes new broadband feed antennas, new high dynamic range low noise amplifiers (LNAs), broadband analog optical fibre links, sophisticated signal conditioning units, and a hybrid digital backend. The upgrade to the analog and digital receiver systems was accompanied by other upgrades such as a next-generation monitor control system, a modern antenna servo system, improvements to the mechanical systems of the antennas, enhancements in data storage and computing resources, along with matching improvements in infrastructure facilities relating to civil and electrical systems. A major technical challenge that was successfully met was to upgrade the entire telescope without significantly disturbing the observations. The GMRT continued to carry out observations throughout the period during which it was being upgraded. The entire design and execution of the upgrade were carried out by staff at NCRA. For some subsystems, such as the telescope control and monitor system, this was done in collaboration with industry partners. The net outcome of the upgrade is what is, in essence, a new telescope, which retains its place as one of the most sensitive interferometers in the world. The upgraded GMRT was officially released to the national and international community in March 2019, although parts of the upgraded system

had been deployed in a phased manner prior to that. New and exciting results from the upgraded GMRT have already started appearing in frontline journals.

These include observations of atomic hydrogen gas in galaxies at frequency ranges that were previously inaccessible to the telescope, measurements of the atomic gas content of galaxies at significantly larger distances than earlier possible, studies of relic radio emission in clusters of galaxies, observations of radio emission from magnetic stars, as

Provide the weblink of the institution

<https://www.tifr.res.in>

### **8.Future Plans of Actions for Next Academic Year**

1. To start a vaccination programme for the students: It was noted that some of the contagious diseases (like chickenpox) can spread in the student hostels very fast. The Medical Officer of TIFR recommended that we should ensure that all the TIFR students come adequately vaccinated, for the safety of them as well as their colleagues. If the students are unable to get the required vaccines before joining the institute, TIFR can facilitate their vaccinations after they join. 2. To organize the event to celebrate the 50th year of Graduate School in TIFR: The physics graduate school of TIFR, with regular coursework required for a Ph.D. degree, started in 1969 and would be completing its Golden Jubilee the next year. This would be a good time to introspect and evaluate the impact of graduate school over the past 50 years. It is planned to organize an event, where TIFR alumni in various fields all over the world will be invited. Panel discussions will be held with eminent people in the field of education, and the direction the TIFR graduate school should take in the future will be discussed. 3. To make all the preparations for the conducting of the JEST exam for the next two consecutive years: NCRA-TIFR was one of the founder institutions that started conducting the Joint Entrance Selection Test (JEST) for admission into physics Ph.D. programmes. This has now grown into a collaboration of more than 30 institutions all over India, who take turns in conducting the examination. TIFR will be conducting this test, on behalf of all the partner institutions, in 2020 and 2021. This will be independent of the TIFR written test and will involve coordination with many institutions across the country. 4. To make the digitization of the University Cell records: TIFR Deemed-to-be University has completed more than 15 years. The paperwork in the University Cell needs to be minimized and the past records need to be recorded in a digital format so that they are available quickly and reliably.