

# Haresh A. Raval

## Post Doctoral Researcher

3/35, Parishram Apartments, Satellite Road,  
Ahmedabad- 380015, Gujarat

Mob: [+91 8707696413](tel:+918707696413) | [haresh.ein@gmail.com](mailto:haresh.ein@gmail.com) |

Date of Birth: 28/11/1988

Nationality: Indian

Marital Status: Single



## Current Position

Visitor,

Department of Physics, Banaras Hindu University,  
Varanasi- 221005, India

## Current Areas of Research

Formal aspects of Field theory, Non perturbative studies in Quantum Chromodynamics,  
Superfield Formalisms, Phenomenology of Heavy ion collisions in High Energy Physics

## Education

1. PhD (Awarded), Specialization: High Energy Physics  
Thesis Title: Implications of a Quadratic gauge in non-perturbative QCD  
Institution: Indian Institute of Technology Bombay (IIT Bombay)  
Supervisor: Prof. Urjit Yajnik  
Thesis submitted: August 2016, Defended: January 2017.
2. B.E. - Electronics and Communication,  
Gujarat University  
Division: First Class  
Year: 2010.
3. 12<sup>th</sup> Std., Science stream  
Gujarat Secondary & Higher Secondary Education Board  
Marks: 76.5 %, Division: Distinction  
Year: 2006.

## Research Experience

1. Visitor,  
Department of Physics, Banaras Hindu University,  
From: 21/04/2022 To: Till present
2. Visitor,  
Department of Physics, IIT Delhi,  
From: 01/06/2021 To: 31/01/2022
3. Institute Post Doctoral Fellow,  
Department of Physics, IIT Delhi,  
From: 21/05/2018 To: 20/05/2021
4. National Post Doctoral Fellow (NPDF),  
Department of Physics, Banaras Hindu University,  
From: 5/09/2017 To: 20/05/2018
5. Research Associate,  
Department of Physics, IIT Bombay,  
From: 1/09/2016 To: 13/08/2017

## Teaching Experience

Institute Post Doctoral Fellow, IIT Delhi

## Publications

Journal: 11 (Single author: 7, First author: 3), Book chapter: 2.

A separate list is attached at the end of Resume.

## Achievements, Awards and Recognitions

1. Awarded National Post Doctoral Fellowship for Project 'Consequences of a Quadratic Gauge and Role of the FFBRST' by SERB, DST, Govt. of India. August 2017.
2. Qualified Graduate Aptitude Test in Engineering (GATE 2011) exam in Physics, Percentile: 99.04, All India Rank 41, February 2011.
3. Qualified Joint Entrance Screening Test (JEST 2011) exam in Physics, All India Rank 104, February 2011.
4. Qualified CSIR-UGC NET Exam for Lectureship, All India Rank 68, June 2012.

5. Qualified TIFR Graduate School-2011 (TIFR GS-2011) exam in Physics, December 2010

## Names and Contact information of Referees

1. Prof. Amruta Mishra  
Designation: Professor  
Department of Physics, IIT Delhi, New Delhi-110016  
Phone : 011 2659 1344  
Email: [amruta@physics.iitd.ac.in](mailto:amruta@physics.iitd.ac.in)
2. Prof. Bhabani Prasad Mandal  
Designation: Professor  
Department of Physics, Institute of Science, Banaras Hindu University,  
Varanasi- 221005  
Mob. No.: 9935048298  
Email: bhabani.mandal@gmail.com
3. Prof. Urjit Yajnik (Thesis supervisor)  
Designation: Professor  
Department of Physics, IIT Bombay, Mumbai-400076  
Phone : 022 2576 7575  
Email: [yajnik@phy.iitb.ac.in](mailto:yajnik@phy.iitb.ac.in)
4. Prof. Umasankar Sankagiri  
Designation: Professor  
Department of Physics, IIT Bombay, Mumbai- 400076  
Phone : 022 2576 7557  
Email: [uma@phy.iitb.ac.in](mailto:uma@phy.iitb.ac.in)
5. Prof. P. Ramadevi  
Designation: Professor  
Department of Physics, IIT Bombay, Mumbai-400076  
Phone : 022 2576 7563  
Email: [ramadevi@phy.iitb.ac.in](mailto:ramadevi@phy.iitb.ac.in)

## List of Publications:

- Journal

1. Haresh Raval and Urjit A. Yajnik,  
Infrared Abelian dominance without Abelian projection,  
Physical Review D 91, 085028 (2015), DOI : 10.1103/PhysRevD.91.085028
2. Haresh Raval,  
Absence of the Gribov ambiguity in a quadratic gauge,  
European Physical Journal C (2016) 76:243, DOI : 10.1140/epjc/s10052-016-4075-z
3. Haresh Raval, Bhabani Prasad Mandal,  
Non- perturbative to perturbative QCD via the FFBRST,  
European Physical Journal C (2018) 78:416, DOI : <https://doi.org/10.1140/epjc/s10052-018-5920-z>
4. Haresh Raval,  
Search for Abelian dominance in the effective  $SO(N)$  theory,  
Physics Letters B 789 (2019) 545–549, DOI : <https://doi.org/10.1016/j.physletb.2018.12.031>
5. Haresh Raval,  
Superspace formulation with a new and extended BRST,  
Physics Letters B 793 (2019) 48–53, DOI : <https://doi.org/10.1016/j.physletb.2019.04.005>
6. Haresh Raval, Bhabani Prasad Mandal,  
Deconfinement to confinement as PT phase transition,  
Nuclear Physics B 946 (2019) 114699, DOI : <https://doi.org/10.1016/j.nuclphysb.2019.114699>
7. Haresh Raval,  
Superspace formulation in the absence of full anti-BRST symmetry,  
EPL, 130 (2020) 21001, DOI : 10.1209/0295-5075/130/21001
8. Haresh Raval,  
Study of Abelian dominance in  $Sp(N)$  QCD in the de Sitter background,  
EPL, 133 (2021) 21001, DOI : 10.1209/0295-5075/133/21001
9. Haresh Raval,  
Compact space and infrared behavior of the Effective QCD  
Annals of Physics 430 (2021) 168512, DOI : 10.1016/j.aop.2021.168512
10. Haresh Raval,  
BRST symmetry as a mechanism for confinement,  
Physics Letters B 820 (2021) 136495, DOI : 10.1016/j.physletb.2021.136495

11. A. Mishra, A. Jahan CS, S. Kesarwani, Haresh Raval, S. Kumar and J. Meena,  
Charmonium decay widths in magnetized matter,  
European Physical Journal A (2019) 55: 99, DOI : 10.1140/epja/i2019-12778-2

- Book Chapter

1. Haresh Raval and Urjit A. Yajnik,  
Infrared Abelian dominance in a special gauge,  
Springer Proc. Phys. 174 5560 (2016)
2. Haresh Raval, Bhabani Prasad Mandal,  
Deconfinement to confinement in a non Hermitian gauge theory,  
Springer Proc. Phys. 261 (2021) 617-630

**Educational articles:**

1. Haresh Raval,  
The quark confinement: Life sentence of fundamental constituents of nature,  
Physics Education (India), 31(2), Apr-June 2015



169099

**ગુજરાત માધ્યમિક અને ઉચ્ચતર માધ્યમિક શિક્ષણ બોર્ડ, ગાંધીનગર**  
**GUJARAT SECONDARY AND HIGHER SECONDARY EDUCATION BOARD, GANDHINAGAR**  
 (પરીક્ષા વિભાગ) વડોદરા (Examination Wing) Vadodara



**પ્રમાણપત્ર CERTIFICATE**

આથી પ્રમાણિત કરવામાં આવે છે કે  
 This is to certify that

**Raval Hareshhkumar Ashokkumar**

માધ્યમિક શાળાંત પ્રમાણપત્ર પરીક્ષા માં ઉત્તીર્ણ થયેલ છે.  
 has passed the Secondary School Certificate Examination.



**ગુણપત્રક STATEMENT OF MARKS**

પરીક્ષાનો માસ અને વર્ષ MONTH & YEAR OF EXAM.	ઉમેદવારનો ક્રમાંક CANDIDATE'S NO.	કેન્દ્ર CENTRE	શાળા ક્રમાંક SCHOOL INDEX NO.	કુલ વિષયો TOTAL SUBJECTS	પત્રક અનુક્રમ નં. SR. NO. OF STATEMENT
MARCH 2004	A 093278	046	51.409	7	658667
વિષયનું નામ ઇન્ડેક્સ નંબર સાથે NAME OF THE SUBJECT WITH INDEX		મેળવેલ ગુણ MARKS OBTAINED			મેળવેલ ગુણ શબ્દોમાં OBTAINED MARKS IN WORDS
		સૈદ્ધાંતિક THEORY	પ્રાયોગિક PRACTICAL	કુલ TOTAL	વિષયવાર ગ્રેડી SUBJECT WISE GRADE
01_GUJARATI HL		//	//	70	SEVEN ZERO DISTINCTION
16_ENGLISH LL		//	//	90	NINE ZERO DISTINCTION
25_SOCIAL STUDIES		//	//	89	EIGHT NINE DISTINCTION
27_SCIENCE		//	//	88	EIGHT EIGHT DISTINCTION
28_MATHEMATICS		//	//	95	NINE FIVE DISTINCTION
30_SANSKRIT		//	//	88	EIGHT EIGHT DISTINCTION
40_SWASTHYA & SHA SHIK		50	49	99	NINE NINE DISTINCTION
કુલ ગુણમાંથી મેળવેલ ગુણ GRAND TOTAL OF MARKS OBTAINED OUT OF		619 / 700 SIX HUNDRED NINETEEN ONLY			
કરજીયાત વિષયોના કુલ ગુણ TOTAL MARKS OF COMPULSORY SUB.		પત્રક અનુક્રમ નં. SR. NO. OF STATEMENT		ટકા PERCENTAGE	પરિણામ RESULT
		658667		88.43	PASS
જન્મ તારીખ (આંકડામાં) DATE OF BIRTH (in Figure)		જન્મ તારીખ (શબ્દોમાં) DATE OF BIRTH (in Words)			
28/11/1988		NOVEMBER TWENTY EIGHT NINETEEN EIGHTY EIGHT			
<p>અગત્યનું : આ દસ્તાવેજમાં સહી કરનાર સત્તાધિકારી સિવાય કોઈ ફેરફાર કરી શકશે નહીં અને જો કરશે તો દસ્તાવેજ રદ થશે અને બોર્ડ કાયદેસરના પગલાં લેશે.</p> <p>IMPORTANT : Any change in this document except by the Issuing Authority will result in cancellation of the document and shall also involve imposition of appropriate legal action.</p>				<p><i>S. Niscent</i>                  પરીક્ષા સચિવ                  EXAMINATION SECRETARY</p>	





ગુજરાત માધ્યમિક અને ઉચ્ચતર માધ્યમિક શિક્ષણ બોર્ડ, ગાંધીનગર  
Gujarat Secondary & Higher Secondary Education Board, Gandhinagar

58034

ગુણપત્રક-ઉચ્ચતર માધ્યમિક પ્રમાણપત્ર પરીક્ષા

વિજ્ઞાન પ્રવાહ SCIENCE STREAM

Statement of Marks obtained in each subject at Higher Secondary Certificate Examination

SCIENCE STREAM

પરીક્ષાનો માસ અને વર્ષ MONTH & YEAR OF EXAM.	કેન્દ્ર નંબર CENTRE NUMBER	શાળા ક્રમાંક SCHOOL INDEX NO.	પત્રક અનુક્રમ નં. SR. NO. OF STATEMENT
MARCH 2006	213	02. 170	107606
બેઠક ક્રમાંક SEAT NO.	ઉમેદવારનું પુરું નામ અટક સાથે CANDIDATE'S FULL NAME BEGINNING WITH SURNAME		
B 055816	RAVAL, HARESHKUMAR ASHOKKUMAR		
વિષયનું નામ / કોડ નંબર સાથે NAME OF THE SUBJECT WITH CODE NO.	કુલ ગુણ TOTAL MARKS	મેળવેલ ગુણ + કૃપા ગુણ MARKS OBTAINED + CONDONATION	મેળવેલ ગુણ શબ્દોમાં MARKS IN WORDS
013 ENGLISH (S. L. )	100	062	ZERO SIX TWO
050 MATHEMATICS	100	091	ZERO NINE ONE
052 CHEMISTRY	100	081	ZERO EIGHT ONE
053 CHEMISTRY PRAC	50	035	THREE FIVE
054 PHYSICS	100	088	ZERO EIGHT EIGHT
055 PHYSICS PRAC	50	040	FOUR ZERO
129 SANSKRIT	100	062	ZERO SIX TWO
TOTAL 384 OUT OF 500 FOR % AND GRADE			
મેળવેલ કુલ ગુણ / કુલ ગુણ માંથી GRAND TOTAL OF MARKS OBTAINED/OUT OF	ટકા PERCENTAGE	પરિણામ RESULT	ગ્રેડી GRADE
459/600	76.80	PASS	DIST
મેળવેલ કુલ ગુણ શબ્દોમાં OBTAINED TOTAL MARKS IN WORDS	FOUR HUNDRED & FIFTY NINE		
અગત્યનું : આ ગુણપત્રકમાં સહી કરનાર સત્તાધિકારી સિવાય કોઈ ફેરફાર કરી શકશે નહીં અને જો કરશે તો ગુણપત્રક રદ થશે અને બોર્ડ કાયદેસરનાં પગલાં લેશે. IMPORTANT : Any change in this statement except by the Issuing Authority will result in cancellation of the statement and shall also involve imposition of appropriate legal action.	MARCH 2006		(i) XO : Indicates 'Exemption' (≥ 35%) (ii) ** Indicates Deficiency Condoned which is not included in obtained Marks. (iii) AO : Indicates 'Absent'.
GRADE : Grade One (With Distinction) : 70% and above Grade One : 60% and above, but below 70% Grade Two : 45% and above, but below 60% Grade Three : To all other candidate including the exempted Passing Standard for Handicapped student is 20%.			
		પરીક્ષા સચિવ/EXAMINATION SECRETARY	



We , the Chancellor, Vice Chancellor and Members  
of the Court of the Gujarat University Certify that  
the withinsigned



**Raval Hareshkumar Ashokkumar**

of LDRP Institute of Technology & Research, Gandhinagar  
having been examined for the degree of  
Bachelor of Engineering in the year 2010  
and adjudged to have passed in the

*First Class,*

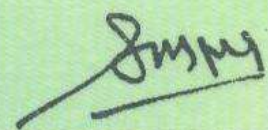
the degree of

**Bachelor of Engineering**

( in its Electronics & Communication Branch )

has been conferred on him at Ahmedabad,  
on the seventh day of the month of January  
in the year two thousand eleven.

In Testimony whereof are set the Seal  
of the said University and  
the Signature of the said Chancellor.



Chancellor





# भारतीय प्रौद्योगिकी संस्थान मुंबई

रावल हर्देश अशोककुमार

को एतद्द्वारा

विद्या वाचस्पति

की उपाधि प्रदान करता है ।

अभिषद की अनुशंसा पर संस्थान की मुद्रांकित यह उपाधि  
अवाप्ति हेतु विनियमों में विहित अपेक्षाओं को पूर्ण कर लेने पर  
तथा अपने शोध-प्रबंध के सफल पक्षपोषण के उपरांत  
मुंबई, भारतीय गणराज्य में आज 12 अगस्त, 2017 को दी गई है ।

## Indian Institute of Technology Bombay

upon recommendation of the Senate hereby confers the degree of  
**Doctor of Philosophy**

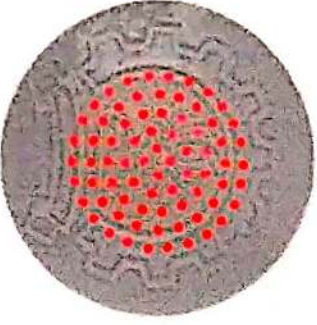
on

**Raval Haresh Ashokkumar**

who has fulfilled the requirements for the degree as prescribed under the  
regulations and successfully defended the thesis entitled:

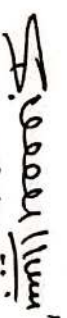
“Implications of a Quadratic Gauge in Non-Perturbative QCD.”

Given this day, under the seal of the Institute at Mumbai in the  
Republic of India, the 12th day of August 2017.



  
अध्यक्ष, अभिषद  
Chairman, Senate

  
कुलसचिव  
Registrar

  
अध्यक्ष, शासी मंडल  
Chairman, Board of Governors



भारतीय प्रौद्योगिकी संस्थान दिल्ली  
**INDIAN INSTITUTE OF TECHNOLOGY DELHI**  
हौज खास, नई दिल्ली -110 016, Hauz Khas, New Delhi-110 016  
दूरभाष/Tel.: +91-11-26591716/1724/1717/7205/7206  
E-mail : ar\_e1@admin.iitd.ac.in, Website : www.iitd.ac.in

## ESTABLISHMENT SECTION - I

नंबर/ No. IITD/IESI/2021/ 3525/7

दिनांक/ Dated: 13.09.2021

### CERTIFICATE

यह प्रमाणित किया जाता है कि डॉ. हरेश ए. रावल 21.05.2018 से 20.05.2021 की अवधि के लिए इस संस्थान के भौतिकी विभाग में पोस्ट-डॉक्टोरल फेलो के रूप में काम किया है। वह ₹78,000/- प्रति माह का समेकित मासिक फेलोशिप (₹60,000/- फेलोशिप + ₹18,000/- एचआरए) आहरित कर रहे थे।

This is to certify that Dr. Haresh A. Raval has served as Post-Doctoral Fellow in the Physics Department of the Institute from 21.05.2018 to 20.05.2021. He was drawing a consolidated pay of Rs. 78,000/- (60,000/- fellowship + Rs. 18,000/- HRA).

सेवा अवधि के दौरान, उनका प्रदर्शन संतोषजनक पाया गया।

During his service period, his performance is found satisfactory.

(डॉ. कल्याण कु. भट्टाचार्य) / (Dr. Kalyan Kr. Bhattacharjee)  
संयुक्त रजिस्ट्रार (स्था- I) / Joint Registrar (E-I)

डॉ. कल्याण कुमार भट्टाचार्य  
Dr. Kalyan Kr. Bhattacharjee  
संयुक्त कुलसचिव/Joint Registrar  
स्थापना - I/E-I  
भारतीय प्रौद्योगिकी संस्थान दिल्ली  
Indian Institute of Technology Delhi  
हौज खास, नई दिल्ली, भारत/Hauz Khas, New Delhi-16, India

Dr. Haresh A. Raval (E.C. 16797)  
Post-Doctoral Fellow  
Deptt. of Physics

Note: किसी भी अस्पष्टता के मामले में, अंग्रेजी संस्करण को वैध माना जाएगा। / In case of any ambiguity, English version will be held valid.





## SERB-Notification

1 message

Dr. Magesh KK <ms\_pm@serbonline.in>  
To: "info@serbonline.in"@imsva02.cdacnoida.in

Wed, Aug 16, 2017 at 12:57 PM



### Science and Engineering Research Board (Statutory Body Established Through an Act of Parliament : SERB Act 2008) Department of Science and Technology, Government of India

#### SCIENCE & ENGINEERING RESEARCH BOARD (SERB)

(Statutory Body Established Through an Act of Parliament : SERB Act 2008)

5 & 5A, Lower Ground Floor  
Vasant Square Mall  
Sector-B, Pocket-5  
Vasant Kunj  
New Delhi - 110 070

#### Approval Letter

File Number: PDF/2017/000066

Dated: 16-Aug-2017

Subject: Your application for the award of SERB National Post-Doctoral fellowship

Dear Dr. Haresh Ashokkumar Raval,

We are happy to inform you that your application cited above has been approved by the Science and Engineering Research Board (SERB) for funding under National Post-Doctoral Fellowship Scheme. The following are the approved items for a period of two years.

Sl. No.	Budget Head	Amount
1.	Fellowship	Rs. 55,000/- per month (consolidated)
2.	Research Grant	Rs. 2,00,000/- per annum
3.	Overheads	Rs. 1,00,000/- per annum

1. You are requested to join the host institute specified in the application within three months from the date of receipt of this letter.
2. After joining the host institute, you are request to upload the joining report through the online portal [www.serbonline.in](http://www.serbonline.in) along with RTGS details of the host institution in the prescribed formats. The formats for the joining report and RTGS details can be downloaded from the online portal.
3. The Sanction Order will be issued within a month once the joining report and RTGS details are uploaded in the online portal. The funds are expected to be released to host institution within three weeks of issue of sanction order. The Fellowship will be effective from the date of joining in the host institution.
4. If you have submitted your thesis and awaiting the award of Ph.D. degree, you will receive Rs. 35000 p.m. (consolidated) as fellowship till you qualify for the eligible degree. The fellowship amount will be enhanced to Rs. 55000 p.m. from the eligible date, on submission of the qualifying degree document. In such a case, you will be required to upload the Ph.D. degree certificate (even if provisional) through the online portal, with intimation to the undersigned by email.

5. You will be governed by the norms of host institution during the tenure of the fellowship. Please visit our website [www.serbonline.in](http://www.serbonline.in) for the terms & conditions of the grant.
6. This approval letter is valid, subject to the fulfilment of all the eligibility criteria for the NPDP and submission of required documents. NPDP position is applicable only to those not in regular services. If you are holding any part time / fulltime job in any of the institution / organization, please inform the status of the same to SERB before joining the host institution.
- 7.

Kindly quote the reference number in all future correspondence. The Fellowship reference no. **PDF/2017/000066** should be mentioned in all research outputs (publications/patent etc.) arising from the fellowship.

With kind regards,

(Dr. Magesh K K)

Scientist

Ph:

Email: [ms\\_pm@serbonline.in](mailto:ms_pm@serbonline.in)

**Dr. Haresh Ashokkumar Raval**

**Banaras Hindu University , Pandit Madan Mohan Malviya Road, Varanasi, Varanasi, Uttar Pradesh-221005**

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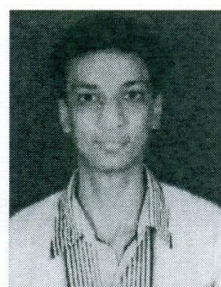
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# GATE 2011 SCORECARD



Name : RAVAL HARESHKUMAR ASHOKKUMAR

Registration No. : PH 3013458

Signature of the Candidate :

## PERFORMANCE IN GATE 2011

Examination Paper : PH - Physics

Number of candidates  
appeared in this paper :

6651

All India Rank

41

Marks out of 100 :

54.33

GATE Score

611

General (GN)

OBC

SC/ST/PD

Qualifying Mark\*

29.05

26.15

19.37

Scorecard Valid Upto : March 14, 2013

Date : March 15, 2011

(Prof. Amitava DasGupta)

Organising Chairperson, GATE 2011

Indian Institute of Technology Madras

On behalf of the National Coordination Board,

Graduate Aptitude Test in Engineering

Department of Higher Education

Ministry of Human Resource Development (MHRD), Government of India (GoI)





RAVAL HARESHKUMAR ASHOKKUMAR  
3/35, PARISHRAM APPARTMENTS,  
B/H JAYSHEFALI ROW HOUSES,  
SATELLITE ROAD,  
AHMEDABAD  
PINCODE: 380015

\* A candidate is considered qualified if the marks secured are more than or equal to the qualifying mark mentioned for the category for which a valid category certificate, if applicable, is produced along with this scorecard.

See reverse side for an explanation of GATE Score and Codes of Paper Sections.

## Results

	Joint Entrance Screening Test(JEST-2011) SCORE CARD
<p>Registration No. : P0100388 Paper Opted for : Physics Candidate Name : RAVAL HARESHKUMAR ASHOKKUMAR Gender : Male Address : 3/35,PARISHRAM APPARTMENTS,B/H JAYSHEFALI ROW HOUSES,SATELLITE ROAD,AHMEDABAD-380015, AHMEDABADAHMEDABAD, Gujarat, Pin Code - 380015</p>	
<p>Examination Date : Sunday,20 February 2011 Total Marks : 42.00 Rank : 104 Note :</p> <ul style="list-style-type: none"><li>• Participating institutes will shortlist candidates depending on their cutoff marks and applicants will directly receive the information about their interview/selection from the respective institute.</li><li>• In some of the participating institutes the students are required to fill up the application form, please check the respective webpages</li></ul>	