Postgraduate Application Form

UNIVERSITY OF CAMBRIDGE
Postgraduate Admissions Office

Naik, Mr Ajinkya Jayant

Course	MASt in Astrophysics (MASAS)	**Date submitted**	10 Nov 2023
Department	Institute of Astronomy	**Mode of study**	Full Time
Course start date	01 Oct 2024 (MT 2024)	**PUF**	No

Academic History

Sep 2020 - Sep 2023	Bachelor of Science (BSc) in Physics (Department of Physics) - All or mostly full-time	A+	University of Pune (former name University of Poon (*India*)

Immigration

Nationality	India (1st)
Country of birth	India
Currently ordinarily resident	India
Country of birth is ordinary residence since birth	Yes
Estimated fee status	Overseas
Visa	Required
Visa type	I do not currently have a UK visa

Language

Type	IELTS (Taken on 01 Nov 2023)
Reference No	23IA515934NAIA007A
Score	**L**: 8.5 **R**: 9.0 **W**: 7.5 **S**: 7.0 **T**: 8
Document	Uploaded

Adverse Effects of COVID

359/2000 chars

The COVID-19 pandemic introduced a delay in the progression of semesters due to late results issued by the university. This also caused a delay in receiving the final degree certificate due to which I decided to take a gap year after completing my bachelors. However, I am using this gap year to undertake new research experience and jobs to build my profile.

Scholarships

Apply for funding	Yes
Apply for Cambridge Trust	Yes
Apply for Gates Cambridge	Yes

* Document not uploaded at the point of submission
** Other university

Curriculum Vitae

Uploaded

Career Goals

877/1000 chars

My aspiration is to pursue graduate and doctoral studies in the field of Astrophysics, with the ultimate goal of working in research and academia. With the recent developments of the LIGO-India project, I am very interested in becoming an active part of the Indian and international LIGO community, and contributing to the advancement of its research frontiers and technological capabilities. A much broader career goal that I hold is to contribute to the quest for a unified field theory and a Quantum Theory of Gravity. I believe understanding the nature of gravitational waves is the key to achieving this. It is one of my goals to bring Astronomy into the rural and under-represented regions of India. I have a strong desire to promote Astronomy and emphasize the importance of pure sciences in my country through a variety of outreach and science popularization programs.

Additional Information to Support Application

933/1000 chars

I am well versed in Python and hold good coding skills required for scientific computation. The workshops which I have attended in gravitational wave astronomy also made me acquainted with some of the gravitational wave data analysis pipelines in Python like PyCBC, GWPy, and GWOSC. I have done a lot of theoretical mini-projects in Python like simulating the two body and three body problems, building a solver of Biot-Savart's law for visualizing the magnetic field of any current carrying conductor, simulating and visualizing a system following the Maxwell-Boltzmann distribution, coding the simulation of a double pendulum, simulating a random walk problem for dice throws, estimating the value of the constant pi using Markov Chain Monte Carlo simulations, etc. During the summer school in gravitational wave astronomy at the International Center for Theoretical Sciences, I also had a crash course in C++ programming language.

Course Specific Questions

Core - statement of interest

General Relativity is one of the most elegant discoveries of Physics and I am fascinated by the groundbreaking astrophysical predictions delivered by it. Gravitational waves is one such prediction of the theory which arouses my interests because they are a recently discovered phenomenon with ongoing advances that will produce new opportunities for research. My first research project at IIT Bombay in theoretical gravitational waveform modeling using Post Newtonian Theory drew me closer to Astrophysical General Relativity and opened many new opportunities for me in this field. A more recent experience working on gamma-ray bursts at ARIES introduced me to the physics of these bursts and acquainted me with the data analysis techniques in High Energy Astrophysics. The shorter duration bursts are believed to be caused by mergers of binary neutron stars and often form the electromagnetic counterparts of gravitational wave signals like the GW170817 event detected by LIGO. Compact binary mergers are the primary observed sources of gravitational waves today, which help us probe the extreme physics of these events. The 4th run of LIGO with an enhanced sensitivity is expected to yield us with new gravitational wave detections possibly accompanied by their electromagnetic counterparts. I desire to employ the knowledge I have gained from my previous experiences in both gravitational wave physics and observational astronomy to study these transient events in the multi-messenger regime.

Core - reasons for applying

The University of Cambridge holds a rich history in the field of Natural Sciences which inspires me to undertake studies at this institution. The research carried out at the Institute of Astronomy in the domains of Cosmology and Stellar Evolution aligns perfectly with my interests and background. I am particularly interested in Prof. Reynolds' work in observational constraints on the spins of black holes which is similar in a way to my ongoing work with Dr. Romero-Shaw and Prof. Mandel. The flexibility in

	choosing courses from different departments will enable me to explore my wide range of interests in both the theoretical and observational aspects of Physics. Apart from my academic interests, I also find the beautiful architecture and vibrant atmosphere of Cambridge very appealing . If given the opportunity, I aspire to pursue my doctoral studies at the University of Cambridge, and attending this program shall serve as a pathway for me to decide on a specialized topic for the same.
Astronomy - Extra Materials WP	Uploaded

Application Information

Academic Awards

Outstanding Student Award	Most outstanding student in terms of academic and extra-curricular achievements.	30 Sep 2023	
Greatest Astronomer Prize	For my essay on Edwin Hubble and his astronomical constributions.	31 Oct 2022	
Mathematics Department Essay Prize	My essay entry on "From Calculus to Cosmology : Journey of Mathematical Physics" .	30 Apr 2022	£10.00
International Astronomy and Physics Competition	For successfully solving mathematical problems in Astrophysics in a limited timeframe.	30 Sep 2020	£10.00

Employment History

Aug 2021 -	Freelancing Content Writer in Physics and Astronomy.	Fiverr and Upwork (*Pune, India*)
Jul 2023 - Nov 2023	Subject Matter Expert (Physics)	Tuetal (*Pune, India*)

Other Applications Made

Theoretical Physics	DAMTP	University of Cambridge (*United Kingdom*)
MSc in Theoretical Physics	Department of Physics	University of Oxford (*United Kingdom*)

Personal Information

Identifying Information

Full name	Naik, Mr Ajinkya Jayant	**Date of birth**	13 Jan 2003
Previous name		**Legal gender**	Male

Contact

Email	najinkya1313@gmail.com	**Phone**	+91- 9423974007 (1st) +91-8766759288 (2nd)
Skype address			
Contact address	A-503, Nirman Landmark,, Near Warje Sports Complex,, Atul Nagar, Warje, Pune, Pune, Maharashtra, 411058, India	**Home address**	Same as contact address
Valid until		**Valid until**	

Dependants

Partner	**WILL NOT** bring partner	**Child**	**WILL NOT** bring children

Disability

Disability	No
Further information	

Adjustment for Interview

Adjustment required	No
Details	

College Preferences

College	Trinity College (1st) Gonville and Caius College (2nd)

Current Membership

College	Not College member

Visa Requirement

Visa type	I do not currently have a UK visa

Study Visas

Applicant previously **HAS NOT STUDIED** in the UK

Visa not entered

Funding Application

Cambridge Trust

Here is a list of CT awards that you would like to be considered

Cambridge International Scholarship
I am a graduate student with a BSc in Physics and a citizen of India. I have scored the highest marks in my batch at the final semester examinations with an SGPA of 9.91/10. I hold substantial research experience and knowledge in Astrophysics.

Cambridge Masters Studentship
I am applying for a MASt in Astrophysics at the Institute of Astronomy, University of Cambridge.

Cambridge Trust Scholarship (postgraduate)
I am an international student holding a citizenship of India applying for a MASt in Astrophysics at the Institute of Astronomy, University of Cambridge.

Chevening/Cambridge Scholarship
I am an international student holding a citizenship of India applying for a MASt in Astrophysics at the Institute of Astronomy, University of Cambridge.

Inlaks Cambridge Scholarship
I am a citizen of India and have completed my bachelor's degree in Physics. I will be applying for the MASt in Astrophysics program at the Institute of Astronomy, University of Cambridge.

Commonwealth (Cambridge) Scholarship
I am a citizen of India and have completed my bachelor's degree in Physics. I will be applying for the MASt in Astrophysics program at the Institute of Astronomy, University of Cambridge.

Gates Cambridge Scholarships (Overseas)

Apply for Gates Cambridge	Yes
US citizen	No
Research proposal	

Personal Statement 3000/3000 chars

Time stopped for a moment in the summer of 2016 when I saw my name in the winner's list of the NASA Space Settlement Contest. As an 8th-grade student living in a small town in India with no exposure to Astronomy, this news was a stepping stone for fulfilling my ambitious dreams. Soon, the news diffused around and I became known as the "NASA Boy" in my town. I was invited to different schools and colleges to give talks on the details of this contest, unaware that doing so would also help introduce the subject of Astronomy to the people of my town and make it apparent that Astronomy and Astrology are two distinct subjects. After completing my schooling, I moved to the metropolitan city of Pune and immediately joined the oldest amateur astronomer's association in India: Jyotirvidya Parisanstha, where I took the responsibility of volunteering to deliver talks and conducting star parties at various venues like corporate offices, schools, orphanages, old age homes, and residential societies. It brings me immense pleasure to witness the spark light up in people's eyes when they first learn about any new phenomenon in Astronomy. I aim to bring Astronomy to rural and underrepresented areas of India, providing passionate individuals in these communities with the necessary exposure. I have accumulated substantial research and educational experience in Gravitational Wave Astronomy and was recently offered the position of Event Outreach Coordinator at the rural site of LIGO-India. However, I had to decline the official position due to conflicting timelines. Despite this, I have still agreed to volunteer and help in the effort to educate the public about the significance of the LIGO-India project. The addition of India to the LIGO network will deliver crucial discoveries in gravitational wave sciences. It is the culmination of massive efforts of scientists and engineers aided by government funds. Thus, it is essential to educate the public about its significance. The unprecedented technology used in these detectors will certainly have applications in everyday life which are not immediately realizable. Akin to the invention of X-Rays which later found applications in the Medical Field or the discovery of Special Relativity supporting

the present GPS technology. I hold Dr. J.V. Narlikar as a source of inspiration who studied Astrophysics at the University of Cambridge and became the most well-known figure in Astronomy in India through his science outreach initiatives. At Cambridge University, I aim to pursue graduate and doctoral studies to study these ripples in spacetime. Gate's Cambridge Scholarship will help me to be able to afford studies at this institute. During my studies, I desire to contribute actively to the community through outreach and popularization programs. In the near future, my dream is to contribute to the LIGO-India community in improving its technological capabilities and reveal the untapped potential of these technologies to the society.

Harding Scholarship

Mastercard Foundation

UKRI

Department Funding

College Funding

Based on the information you have provided, you are eligible to apply for these awards.

Girton Joyce Biddle Scholarship

You have applied for Girton Joyce Biddle Scholarship

Sheepshanks Studentship in Astronomy

You have applied for Sheepshanks Studentship in Astronomy

Wolfson College & Rowan Williams Cambridge Studentship

Separate application form
To be considered for this studentship, applicants should complete and return a separate application form to the Trust, which has been designed to assist the Trust in the identification of eligible candidates. The Rowan Williams Cambridge Studentship application form is available at https://www.cambridgetrust.org/our-scholarships/highlighted-scholarships/rowan-williams-cambridge-studentship.
Notes for applicants:
The Rowan Williams Cambridge Studentships are not available for courses offered by the Institute of Continuing Education, premium rate courses offered by the Judge Business School (including MBA, MFin, EMBA etc.) or for courses where the fees are charged at the higher Clinical rate.
Selection panels will assess applications taking regard of the severity of barriers faced to pursuing higher education at the University of Cambridge.

Your Funding

Funding Sources

No funding sources entered

Declaration

The information you have provided forms the legal basis of your application to the University of Cambridge. We reserve the right to refuse admission in the event of any misrepresentation by you. Submission of an application does not imply an offer of admission.

- The University of Cambridge, the Cambridge Colleges, the Gates Cambridge Trust and the Cambridge Commonwealth, European and International Trust (and their collaborators) will use your personal information for the purpose of processing your applications for admission and funding and deciding whether to offer you a place for the course you have applied for. For further information on the use of your personal information during the application process, please see How we use your personal information (for applicants).
- I certify that all the information given in this application is complete and accurate. I also understand that if I have given false or misleading information, the University of Cambridge will not admit me as a Postgraduate student and may take legal action against me.
- I certify that I am the original and sole author of all work submitted as part of this application, except where clearly indicated otherwise.
- I understand that if my application is unsuccessful, the papers relating to it will be destroyed and cannot be returned.

I confirm that I have read, understand and agree to the above declarations.

Savitribai Phule Pune University

(formerly University of Pune)

Telephone : 020 - 25621376 / 77
Web : *www.unipune.ac.in*

Ganeshkhind, PUNE-411007.
e-mail : *transcript@unipune.ac.in*

TRANSCRIPT

This is to certify that **MR./MS. NAIK AJINKYA JAYANT MOTHER'S NAME : RUPALI (SEAT NO. 1036)** has appeared for the **BACHELOR OF SCIENCE (REV. 2019)** examination of this University held in **APRIL, 2023** and is declared to have passed the said examination in **GRADE "A+"**.

He/She has obtained following marks at the said examination. **(PRN NO. 1172000777)**

SEM.	SUB_ CODE	NAME OF THE COURSE	< - MARKS - > INT	UEX	TOT	CRE DITS	GR ADE	GP
SPECIAL SUBJECT : PHYSICS								
3	MT-231	CALCULUS OF SEVERAL VARIABLES	11	35	46	02	O	20
	MT-232A	NUMERICAL METHODS AND ITS APPLICATIONS	13	29	42	02	A+	18
	MT-233	MATHEMATICS PRACTICAL	12	30	42	02	A+	18
	PHY-231	MATHEMATICAL METHODS IN PHYSICS – I	15	35	50	02	O	20
	PHY-232	(B) INSTRUMENTATION	15	32	47	02	O	20
	PHY-233	PHYSICS LABORATORY – 2A	13	31	44	02	A+	18
	ST-231	DISCRETE PROBABILITY DISTRUBUTIONS AND TIME SERIES	14	35	49	02	O	20
	ST -232	CONTINUOUS PROBABILITY DISTRIBUTIONS	15	29	44	02	A+	18
	ST -233	STATISTICS PRACTICAL	14	34	48	02	O	20
	AECC-II	A LANGUAGE – ENGLISH	15	35	50	02	O	20
	AECC-I	ENVIRONMENTAL AWARENESS	14	35	49	02	O	20
4	MT-241	LINER ALGEBRA	12	26	38	02	A+	18
	MT-242B	DYNAMICAL SYSTEMS	11	29	40	02	A+	18
	MT-243	MATHEMATICS PRACTICAL BASED ON MT-241 & MT-242	08	16	24	02	C	10
	PHY-241	OSCILLATIONS, WAVES & SOUND	15	34	49	02	O	20
	PHY-242	OPTICS	13	27	40	02	A+	18
	PHY-243	PHYSICS LABORATORY – 2B	13	30	43	02	A+	18
	ST-241	TESTS OF SIGNIFICANCE AND STATISTICAL METHODS	12	32	44	02	A+	18
	ST -242	SAMPLING DISTRIBUTION AND EXACT TESTS	12	19	31	02	A	16
	ST -243	STATISTICS PRACTICAL	11	28	39	02	A+	18
	AECC-IV	A LANGUAGE – ENGLISH	13	27	40	02	A+	18
	AECC-III	ENVIRONMENTAL AWARENESS	10	27	37	02	A	16
5	PHY-351	MATHEMATICAL METHODS IN PHYSICS – II	15	24	39	02	A+	18
	PHY-3510H	ENERGY STUDIES	14	31	45	02	O	20
	PHY-3511K	PHYSICS WORKSHOP SKILL	15	29	44	02	A+	18
	PHY-352	ELECTRODYNAMICS	15	30	45	02	O	20
	PHY-353	CLASSICAL MECHANICS	15	32	47	02	O	20
	PHY-354	ATOMIC & MOLECULAR PHYSICS	13	24	37	02	A	16
	PHY-355	COMPUTATIONAL PHYSICS	14	27	41	02	A+	18
	PHY-356A	ASTRONOMY & ASTROPHYSICS – I	13	29	42	02	A+	18
	PHY-357	PHYSICS LABORATORY – 3 A	15	33	48	02	O	20
	PHY-358	PHYSICS LABORATORY – 3 B	15	30	45	02	O	20
	PHY-359	PROJECT – I	13	30	43	02	A+	18
6	PHY-361	SOLID STATE PHYSICS	14	34	48	02	O	20
	PHY-3610Y	APPLICATIONS OF INTERNET OF THINGS (IOT)	15	33	48	02	O	20
	PHY-3611(AB)	INSTRUMENTATION FOR AGRICULTURE	15	30	45	02	O	20
	PHY-362	QUANTUM MECHANICS	15	35	50	02	O	20
	PHY-363	THERMODYNAMICS AND STATISTICAL PHYSICS	14	34	48	02	O	20
	PHY-364	NUCLEAR PHYSICS	15	29	44	02	A+	18
	PHY-365A	ELECTRONICS-II	13	34	47	02	O	20
	PHY-366S	LASERS	14	31	45	02	O	20
	PHY-367	PHYSICS LABORATORY – 4 A	14	33	47	02	O	20
	PHY-368	PHYSICS LABORATORY – 4 B	14	33	47	02	O	20
	PHY-369	PROJECT – II	15	33	48	02	O	20
					TOTAL	88		824

SGPA : (1) 9.59 (2) 9.45 (3) 9.64 (4) 8.55 (5) 9.36 (6) 9.91

F.Y. CREDITS : 44 ADD-ON CREDITS : 4 GRADE POINTS : 419 % OF MARKS : 87.68 CGPA : 9.42

FINAL GRADE : A+

MEDIUM OF INSTRUCTION : ENGLISH

REF. NO. : EXAM./TRANS./2023/6037
DATE : 25/09/2023

Savitribai Phule Pune University (Formerly University of Pune) Certificate Unit Pune-7

for DIRECTOR
BOARD OF EXAMINATIONS & EVALUATION

MAHARASHTRA EDUCATION SOCIETY'S

ABASAHEB GARWARE COLLEGE

Karve Road, Deccan Gymkhana, Pune – 411 004, Maharashtra, India

Affiliated to Savitribai Phule Pune University

NAAC Re-accredited – 'A' Grade

Best College Award – Savitribai Phule Pune University

I.D. No: PU/PN/C/009 (1945) / JR. COLLEGE ROAD: 11.11.003AISHE CODE: C-41477-2018

STATEMENT OF GRADES FOR: BSc_2019 Pattern CREDIT PATTERN Apr-2021

SEAT NO.: 589 **CENTRE:** CAAP010040 **PERM REG. NO.:** 1172000777

NAME: NAIK AJINKYA JAYANT **MOTHER:** RUPALI

	Crd	Grd	Grd Pnt	Crd Pnt
EL-111-BASICS OF APPLIED ELECTRONICS	2	A+	9	18
EL-112-ELECTRONIC DEVICES AND CIRCUITS	2	O	10	20
* EL-113-PRACTICAL COURSE-I	1.5	O	10	15
MT-111-ALGEBRA	2	O	10	20
MT-112-CALCULUS-I	2	A+	9	18
MT-113-MATHEMATICS PRACTICAL	1.5	A+	9	13.5
PHY-111-MECHANICS AND PROPERTIES OF MATTER	2	O	10	20
PHY-112-PHYSICS PRINCIPLES AND APPLICATIONS	2	O	10	20
* PHY-113-PHYSICS LABORATORY-IA	1.5	O	10	15
ST-111-DESCRIPTIVE STATISTICS-I	2	O	10	20
ST-112-DISCRETE PROBABILITY	2	A+	9	18
* ST-113-STATISTICS PRACTICAL PAPER-I	1.5	A+	9	13.5

First Semester SGPA : 9.591 Credits Earned/Total : 22/22 Total Credit Points: 211

* EL-121-FUNDAMENTALS OF DIGITAL ELECTRONICS	2	O	10	20
* EL-122-ANALOG AND DIGITAL DEVICE APPLICATION	2	O	10	20
* EL-123-PRACTICAL COURSE II	1.5	A+	9	13.5
* MT-121-ANALYTICAL GEOMETRY	2	A	8	16
* MT-122-CALCULUS - II	2	O	10	20
* MT-123-MATHEMATICS PRACTICAL	1.5	A+	9	13.5
* PHY-121-HEAT AND THERMODYNAMICS	2	O	10	20
* PHY-122-ELECTRICITY AND MAGNETISM	2	O	10	20
* PHY-123-PHYSICS LABORATORY _IB	1.5	O	10	15
* ST-121-DESCRIPTIVE STATISTICS II	2	O	10	20
* ST-122-DISCRETE PROBABILITY DISTRIBUTIONS	2	A+	9	18
* ST-123-STATISTICS PRACTICAL PAPER II	1.5	A	8	12

Second Semester SGPA : 9.455 Credits Earned/Total : 22/22 Total Credit Points: 208

First Year Total Credits Earned : 44/44

* 22999-DEMOCRACY , ELECTION AND GOVERNANCE	2	O	^
* G-1-PHYSICAL EDUCATION (GROUP-I, SEM-II)	2	A	^

^ Non-Credit Course

Medium of Instruction: ENGLISH

PRINCIPAL

STATEMENT NO.: 273

DATE: 27-Sep-2021

M.E.S. Abasaheb Garware College Pune-4.

Savitribai Phule Pune University, Pune

10 Point Credit System: Grade Point Details

Sr. No.	% of Max. Marks	Grade Point	Grade
1	90 ≤ Marks ≤ 100	10	O(Outstanding)
2	75 ≤ Marks ≤ 89	9	A+(Excellent)
3	60 ≤ Marks ≤ 74	8	A (Very Good)
4	55 ≤ Marks ≤ 59	7	B+(Good)
5	50 ≤ Marks ≤ 54	6	B(Above Average)
6	45≤ Marks ≤49	5	C(Average)
7	40≤ Marks ≤44	4	D(Pass)
8	Marks <40	0	F(Fail)
9	Nil	0	Ab(Absent)
10	--	0	FX (Detained, Repeat the Course)
11	--	0	IC (Incomplete Course-Absent for Exam but continue for the course)
12	--	0	AC (Audit Course Completed)
13	--	--	ACN (Audit Course Not Completed)

Sr. no.	CGPA	Grade
1	9.50 and above	O(Outstanding)
2	8.25 ≤ CGPA ≤ 9.50	A+(Excellent)
3	6.75 ≤ CGPA ≤ 8.25	A (Very Good)
4	5.75 ≤ CGPA ≤ 6.75	B+(Good)
5	5.25 ≤ CGPA ≤ 5.75	B(Above Average)
6	4.75 ≤ CGPA ≤ 5.25	C(Average)
7	4.00 ≤ CGPA ≤ 4.75	D(Pass)

Percentage of Marks =

If O grade then 20 X CGPA - 100

If A+ grade then 12 X CGPA –25

If A grade then 10 X CGPA – 7.5

If B+ grade then 5 X CGPA – 26.25

If B grade then 10 X CGPA – 2.50

If C grade then 10 X CGPA –2.50

If D grade then 6.6 X CGPA + 13.6

I. Semester Grade Point Average (SGPA) =

$$SGPA = \frac{\sum_{i=1}^{p} Ci \quad Gi}{\sum_{i=1}^{p} Ci}$$

$$SGPA = \frac{\sum \ Grade\ Points\ Earned\ x\ Credits\ for\ each\ course}{\text{Total Credits}}$$

ii. Cumulative Grade Point Average (CGPA) =

$$CGPA = \frac{\sum_{i=1}^{p} Ci \quad Gi}{\sum_{i=1}^{p} Ci}$$

$$CGPA = \frac{\sum \ Grade\ Points\ Earned\ x\ Credits\ for\ each\ course}{\text{Total Credits}}$$

ABBREVIATIONS

AA = Absent
Tot = Total
C = Carried forward
CRD = Credit
EE = External
EX = Exemption
F = Fail in Subject/Course
SL = Sessional
GRD = Grade
TH = Theory Paper
VV = Viva

OL = Online Exam
Or = Oral
P = Pass
PC = Performance Cancelled
PJ = Project
PP = Paper
PR = Practical
= Ordinance 2
TEX = Term End
OBT = Obtained Marks
MAX = Maximum Marks

= Ordinance 4
& = Ordinance 163
$ = Ordinance 1
@ = Ordinance 1+163
* = Current appearance
| = Non credit course
GP = Grade Point
Min = Minimum Marks
^ = Under Class Improvement
INT = Internal Examination
TW = Term Work

Academic reference for **Mr Ajinkya Jayant Naik**

MASt in Astrophysics

Referee Details

Name	Dr Isobel Romero-Shaw	**Job title**	Herchel Smith Fellow
Email	ir346@cam.ac.uk	**Department**	Applied Mathematics & Theoretical Physics (DAMTP)
Phone		**Institution**	University of Cambridge
Relationship	Informal Summer Project Supervisor	**City**	Cambridge
Known for	May 2023 to present	**Country**	United Kingdom

Reference

Academic ranking	Referee is not able to provide an academic ranking, please see details below. I cannot compare Ajinkya's performance to others since I have only supervised two other undergraduate students and on very different projects.
Student potential	Distinctly original/creative/independent of thought
Course suitability	Exceptionally Suitable

Reference provided as uploaded file. Please see the next page.

UNIVERSITY OF CAMBRIDGE
Department of Applied Mathematics and Theoretical Physics

Dr Isobel Romero-Shaw
Herchel Smith Fellow, Department of Applied Mathematics and Theoretical Physics, University of Cambridge
Wilberforce Road
Cambridge, CB3 0WA
Email: ir346@cam.ac.uk

12/10/23

To whom it may concern,

I am writing to recommend Ajinkya Naik for a position on the MASt Astrophysics course. I first talked with Ajinkya in May 2023, when he emailed to ask for supervision in a summer research project. Although I have not met Ajinkya in person, I have been extremely impressed with the quality and efficiency of his work during the five months in which we have been in email correspondence. I gave Ajinkya an ambitious project for an undergraduate student: characterising the spins of binary black hole mergers that evolve through a high-mass X-ray binary phase, using the output of a population synthesis code. Ajinkya has shown himself to be a rapid learner, quickly getting to grips with the theoretical background and practical programming skills needed for this project. In fact, he has already completed the project I initially outlined, and is now beginning to use his spin model to investigate the origins of real binary black hole mergers detected with gravitational waves.

I believe that Ajinkya has every quality that would lead him to succeed as a Master's student at Cambridge. He is enthusiastic, diligent, self-motivated, and hardworking. I address below the specific categories outlined in the guidance for referees.

1. **Academic results to date**
   Ajinkya's academic results are impressive. Although I do not have first-hand experience of his undergraduate exam results or coursework, his record shows that he achieved top marks in his undergraduate Physics exams.

2. **Knowledge of the proposed field of study**
   Ajinkya already has a variety of experience working on projects in different areas of astrophysics. He has very good knowledge of Physics, Astrophysics, and General Relativity. He is keen to learn more about these subjects, and has attended multiple summer schools and sought out additional projects to pursue this goal.

3. **Critical evaluation skills and independence of thought**
   In my interactions with Ajinkya, he has shown great ability to spot flaws in his own methods and think about ways to improve his working. Additionally, he has won several prizes in physics and astrophysics competitions relying on innovation and independent thought. Ajinkya's drive to find new astrophysics projects to pursue is also evidence of his

UNIVERSITY OF CAMBRIDGE
Department of Applied Mathematics and Theoretical Physics

critical evaluation skills, showing an understanding that this wealth of experience will be valuable when completing his Master's in Astrophysics.

4. **Aptitude and potential**
   In our interactions over the past five months, Ajinkya has proven himself to be driven, ambitious, curious, and passionate about physics and astrophysics. These qualities are also reflected in his CV. Combined with his excellent academic record, these qualities make Ajinkya an ideal candidate for the MASt Astrophysics program.

5. **Other relevant experience and skills**
   Although Ajinkya's summer project with me has not yet been published, it is highly likely that his work will lead to a publication within the next year. This is unusual for an undergraduate student, demonstrating his high level of performance, and will give him a competitive edge in his future academic career.

6. **Non-native English speakers only**
   Ajinkya's communication in English is indistinguishable from that of a native English speaker.

Best regards,

Dr Isobel Romero-Shaw

UNIVERSITY OF CAMBRIDGE
Department of Applied Mathematics and Theoretical Physics

Academic reference for **Mr Ajinkya Jayant Naik**

MASt in Astrophysics

Referee Details

Name	Dr Pravin Dusane	**Job title**	Professor
Email	prd.agc@mespune.in	**Department**	Department of Physics
Phone	+91-9834765787	**Institution**	Abasaheb Garware College , Pune
Relationship	Course Instructor	**City**	Pune
Known for	January 2022 to present	**Country**	India

Reference

Academic ranking	The best performance you have known in the last 5 years Every year, our department admits around 40-50 students for pursuing a BSc in Physics on the basis of academic merit. I have seen many enthusiastic students passionate for Astrophysics but Mr. Ajinkya stood out amongst all of them because of his outstanding achievements and consistent efforts in both the academic coursework as well as in research. He was selected for schools, workshops and internships in some of the most prestigious national institutions. This was not achieved by any student that I have known in the past five years at least.
Student potential	Outstandingly original/creative/independent of thought
Course suitability	Exceptionally Suitable

Dear Admissions Committee,
It brings me great pleasure to write this recommendation letter on behalf of Mr. Ajinkya Naik for his application to your graduate program in Astrophysics at the University of Cambridge. I have had the pleasure of teaching the Electrodynamics and Solid State Physics courses to him as part of the Bachelor of Science in Physics program offered at the Department of Physics, Abasaheb Garware College during the academic years of 2020-2023. Ajinkya has always impressed me with his immense dedication and passion for Physics, particularly Astrophysics.
From the time since I have known him, he has occurred to me as an exceptional student in terms of his academic and research performance. Ajinkya has consistently managed to maintain a stellar academic record throughout his three-year studies. For the final semester, he achieved phenomenal results and stood at the top of the class with an SGPA of 9.91 out of 10. In addition to this, he demonstrated a quick understanding and rapid learning pace during the experiment sessions in laboratory. There was an utmost sincerity in completing the coursework assignments and tasks from his part. One of his qualities that stood out the most to me is being attentive and interactive throughout the lectures. He was able to answer majority of the questions which were posed during the lectures and demonstrated efforts to think through those questions which were particularly tricky to answer. This is an indicator of the broad knowledge of Physics that he holds as well as a sign of his critical thinking. His foundations in Physics and Mathematics are very solid. Ajinkya has always showed willingness to learn something new within as well as beyond the regular coursework. This is displayed by the variety of schools, workshops and research projects undertaken by him. His work has been mainly concentrated in General Relativity, Gravitational Waves and Astrophysics. Mathematics is central to these subjects and as a result Ajinkya has greatly honed his abstract mathematical skills by studying them. By the time our coursework reached Quantum Mechanics and Special Relativity, he was already way ahead possessing a working understanding of some advanced concepts in quantum theory like the various interpretations of quantum mechanics, perturbation theory in quantum mechanics, quantum field theory, and of course in General

Relativity. I strongly believe that his experience and qualities make him suitable for pursuing his interests in General Relativity and Astrophysics.
His bachelor’s thesis was one of a kind, based on an important phenomenon in Radio Astronomy: the 21 cm Hydrogen Line. Mr. Ajinkya dedicated immense efforts in taking the observations for this project on his own and achieved valuable results from them. His ability to draw logical inferences and conclusions from the data was truly remarkable like the possible sources of a particular noise spike in the data. This quality puts him in a good position to undertake research in Astronomy. Recently after graduating, he was selected as a Visiting Student at the Aryabhatta Research Institute of Observational Sciences : a premier astronomical research institute ran by the government of India which also hosts the largest optical telescope in Asia. There, he worked on gamma-ray bursts and acquired valuable skills in High Energy Astrophysics data analysis. Mr. Ajinkya is an excellent writer and is able to write compelling pieces of articles and essays in Astrophysics. As an undergraduate student, he won many awards for his essay writings. For example: In 2022, he was awarded a personal virtual tour of the Herschel Museum of Astronomy in Bath for the "Greatest Astronomer Essay Prize" by the Bath Royal Literary and Scientific Institution. Mr. Ajinkya's essay titled : "From Calculus to Cosmology : The Journey of Mathematical Physics" also won him a cash award at the Department of Mathematics in SVKT College, University of Pune. He has the skill to break down complex concepts in Physics into a much simpler language which is easy to understand for the layman audience, something which he achieves by clever use of analogies and examples from daily life. Mr. Ajinkya also possesses good scientific writing skills which was seen from his detailed and coherent project report for the Bachelor's thesis.
Apart from the academic achievements, Mr. Ajinkya is a responsible and well-rounded individual. He played an active role in the organization and coordination of numerous events and activities that are regularly conducted by our Department of Physics including his talks on gravitational wave astronomy, departmental festivals and competitions, lecture series by guest experts and much more. He is also working with the Event Project Outreach (EPO) team at LIGO-India in educating the masses about the importance of LIGO-India project.
In conclusion, I have no doubt that Ajinkya is not only qualified for your program in Astrophysics but is also an ideal candidate to contribute significantly to your academic community. I have witnessed his incidental development and progression throughout the course of his undergraduate studies. Despite of the fact that our department has no faculty member directly working in Astrophysics, Ajinkya was able to make the most out of the teaching and guidance of our experienced faculty and pursued his passion religiously. Being admitted to your university will be very helpful for his goals and dreams, and I am certain that he will make the most out of the opportunities offered to him. I strongly and wholeheartedly recommend him for admission into your university and hope that this recommendation letter would aid you in assessing his suitability for the course.

- Regards,
  P.R. Dusane.

UNIVERSITY OF CAMBRIDGE

We thank you for your time spent taking this survey.
Your response has been recorded.

Below is a summary of your responses Download PDF

Institute of Astronomy

Important: please read before continuing
In this form, you will be asked a series of questions to help us gather information about your **previous** university study. The questions relate to your previous study, not the course that you are currently applying to. Depending on department procedures, relevant contextual data may have a small impact on some funding opportunities, so if your application is eligible for University funding, we encourage you to fill in this form.

You will be given the opportunity to tell us about any events or circumstances that have had an impact on your education, and limited your ability to perform in your studies. **You do not need to provide personal or detailed information about these circumstances**, we only ask you give details of the **impact** that they have had on your studies.

Please only provide the information that you are asked for in the form, and leave the text box blank if you cannot/ do not wish to respond. You should only provide information in the form if you feel comfortable to do so. Your application will not be disadvantaged if you choose not to respond to the questions, and your academic merit will be assessed based on the information you provide in other parts of the application. Once you have completed this form, you will need to download a PDF copy of your answers to upload to the applicant portal. You will be given the option to download the PDF at end of the form, and you will also receive a copy by email. This

the PDF at end of the form, and you will also receive a copy by email. This will be sent to you as soon as the form is submitted.

Your first name:

Ajinkya

Your surname:

Naik

Your email address:

najinkya1313@gmail.com

Confirm your email address:

najinkya1313@gmail.com

The following questions relate to your experience of studying at undergraduate/ bachelor's level.

Your undergraduate/ bachelor's institution:

Abasaheb Garware College, University of Pune

Did you undertake your degree full-time or part-time?

- (●) **Full-time**
- ( ) Part-time (for any part of the degree)

When choosing your university, were there any factors other than grades that you felt limited your choice of institution?

e.g. not being able to live away from home, financial considerations, concerns about fitting in

I held multiple offers for pursuing my undergraduate studies in Astrophysics at reputed institutions in UK like the University of Glasgow, University of Edinburgh, University of St. Andrews and the Newcastle University. However due to a lack of financial support, I couldn't afford undertaking studies at any of these institutions.

Characters remaining: 668

Did you have any essential regular commitments that impacted the extent to which you could dedicate yourself to your studies? If so, please explain the impact of this on your studies.
e.g. caring responsibilities, being a single parent or guardian, employment during studies

Characters remaining: 1000

Did you experience any serious disruption to your studies that prevented you from studying for at least 3 months over the course of a year? If so, please explain the impact of this on your studies. It is not necessary to provide details about the nature of the disruption.
e.g. illness, bereavement

Characters remaining: 1000

The following questions relate to your previous experience of university study at all levels (undergraduate and/or postgraduate).

Some students get off to a slower start than others in their studies, and later show an upward progression in their marks.
Were there any circumstances that you feel initially inhibited your academic performance? If so, please provide details of the impact on your studies, and the change in circumstances that allowed you to improve your performance.

Characters remaining: 1000

Please use the space below to let us know about anything else that has had an impact on your studies or educational pathway. You might like to explain any incomplete qualifications or course changes.

The Department of Physics at my home-institution lacked a dedicated Astrophysics/Astronomy research group and the entire faculty's research was in Material Sciences. As a result, I had limited opportunities in terms of exposure to the research and programs in Astrophysics. Similarly, some of the faculty discouraged or not appreciated pursuing further studies in this field. Owing to this, I had to undertake most of my research and knowledge in Astrophysics by attending schools, workshops and internships from external research institutions.

Characters remaining: 456

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Ajinkya Naik

+91-9423974007 • najinkya1313@gmail.com • https://astroajn.blogspot.com/

RESEARCH INTERESTS

I am interested in the field of Observational Astronomy and Astrophysical Relativity. My research and background primarily focuses on Gravitational Wave Astronomy.

EDUCATION

Bachelor of Science (BSc) *Physics (Elective Subjects : Astrophysics, LASERs)* 2020-2023
Abasaheb Garware College, University of Pune. CGPA : 9.42/10 ; 87.68%

High School *HSC Science* 2018-2020
Fergusson College, Pune. 78.46%

Schooling *ICSE* 2007-2017
North Point School, Dhule. 93.6%

RESEARCH EXPERIENCE

1] University of Cambridge | *Research Project* May 2023 - Present

- I am working with Dr. Isobel Romero-Shaw (DAMTP, University of Cambridge) and Prof. Ilya Mandel (Monash University) on understanding the progenitors of Binary Black Hole Mergers detected by LIGO.
- Using COMPAS (Compact Object Mergers: Population Astrophysics and Statistics) code for population synthesis of binary star systems.
- Studying the output of COMPAS to formulate a hyper-prior model distribution for the effective spins (χ_{eff}) of low metallicity binary black hole systems.
- Using stellar evolution theory of binary star systems to determine factors affecting the effective spins like mass loss and natal kick received during supernova, mass transfer, evolutionary pathways taken by the components, etc.
- Applying Hierarchical Bayesian Inference using LIGO population statistics data and the hyper-prior model to investigate what fraction of Binary Black Hole mergers detected by LIGO have evolved from Black Hole-High Mass X-Ray Binary systems.

2] Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital | *Visiting Student* Sep 2023 - Nov 2023

- I carried out a full-time research project titled: *"GRB 210306A : A Multi-Wavelength Analysis"*. under the supervision of Dr. Kuntal Misra (Scientist-E) at ARIES
- Analyzed the data for GRB 210306A across multiple wavelengths to understand its temporal and spectral properties.
- Primarily relied on data from NASA's Fermi and Swift missions using software packages like HEASOFT, Fermitools and GBM tools for data analysis and spectral fitting.
- Examining the afterglow data in X-Ray and Optical wavelengths revealed possible signature of a jet-break associated with the GRB.
- Presented the project work to the group of scientists and students at ARIES.

3] Indian Institute of Technology Bombay (IITB) | *Summer Project Student* July 2022 - Oct 2022

- First research experience under the supervision of Mr.Sagar Kumar Gupta and Dr.Archana Pai titled : "Generating Gravitational Waveforms using Post Newtonian Theory".
- Studied the gravitational wave theory and the Post Newtonian formalism for the first half duration of project.
- Generated gravitational waveform templates using the Quadrupole formula and Post Newtonian equations in Python for different source parameters.
- Examined the effect of changing parameters on the waveform, increasing the order of PN corrections and obtained a limit on the effectiveness of Post Newtonian waveforms in terms of the parameters like masses, duration of the merger, etc.
- Further tested the waveforms by implementing Matched Filtering with the LIGO data to demonstrate the accuracy of Post Newtonian waveforms in extracting gravitational wave signals buried in noise.
- Presented the project results in an online meeting with IITB faculty and students.

4] Abasaheb Garware College, Pune | *Bachelor's Thesis* Nov 2022 - June 2022

- My bachelor's thesis was titled : *"Detecting H-I emissions from the Milky Way galaxy using a Horn Telescope"* under the supervision of Prof. M.B. Kute (Professor of Astrophysics at Garware College) & Dr. Avinash Deshpande (Astrophysicist at Raman Research Institute, Visiting Professor at IUCAA). We fabricated a horn antenna from scratch using various materials and electronic components to observe the 21 cm Hydrogen Line from the galactic plane.
- This data was clubbed with the data obtained from a similar experiment we conducted during the Radio Astronomy Winter School using a Horn Antenna at the Radio Physics Lab, IUCAA.
- The data was analyzed in Python to study the radiometer characteristics and estimating the line of sight velocity using Doppler shift of H-I Line. The rotation curve of Milk Way galaxy was obtained showing significant deviation from the Keplerian rotation curve.
- Presented a poster of the project at the Inter-University Center for Astronomy and Astrophysics (IUCAA) and Fergusson College during the *Frontiers in Physics* program.

SCHOOLS

1] Mini School on Gravitation & Cosmology | *Indian Institute of Technology Madras* Nov 2022

- Participated in a 4-day mini school on gravitation and cosmology organized by the Center for Strings, Gravitation and Cosmology (CSGC) at IIT Madras.
- School consisted of an introductory course on General Relativity, Cosmology, and Gravitational Wave Science by prominent experts in the from Raman Research Institute, Institute of Mathematical Sciences and Chennai Mathematical Institute.

2] 15th Radio Astronomy Winter School | *IUCAA-NCRA, Pune* Dec 2022

- One of the top 30 students from India selected for this 10-day school jointly organized by the Inter-University Centre for Astronomy & Astrophyiscs (IUCAA) and the National Centre for Radio Astrophysics - Tata Institute of Fundamental Research (NCRA-TIFR).
- School consisted of lectures, experiments and discussion sessions with renowned experts in the field of Radio Astronomy.
- A study visit to the Giant Meterwave Radio Telescope (GMRT) ran by NCRA-TIFR was also organized.
- School concluded with writing experiment reports and delivering presentation of the understanding and results gained from the experiments.

3] Summer School in Gravitational Wave Astronomy | *International Center for Theoretical Sciences, Bangalore* Jul 2023

- I was the only undergraduate student selected for this school organized by the International Center for Theoretical Sciences - Tata Institute of Fundamental Research (ICTS-TIFR).
- The primary topic of the school was - "Numerical Relativity". The school comprised of lectures and hands-on tutorial sessions.
- The lectures series were : *Numerical Relativity : Mathematical Formulation* (Prof. Baumgarte), *Introduction to numerical relativistic hydrodynamics* (Prof. Kiuchi), *Theory and Numerics of Partial Differential Equations* (Dr. Pfeiffer), and *Modern Numerical Methods in Computational Relativity* (Dr. Lovelace).
- Tutorials comprised of solving mathematical problems in Numerical Relativity, solving the Sod's problem using different solvers in Python and using parallel computing and the *SpECTRE* code in a Docker container.

4] Giambiagi Winter School on Cosmology | *Abdus Salam International Center for Theoretical Physics (ICTP)* Jul 2023

- Participated remotely in the winter school.
- Lectures on many interesting topics like General Relativity and Cosmological Models, Cosmic Microwave Background, Statistical Methods in Cosmology and Gravitational Wave Astronomy.

WORKSHOPS

1] Workshop on Gravitational Waves & LIGO-India | *IUCAA and Goa University* Nov 2023

2] 2023 Sagan Exoplanet Summer Workshop | *National Aeronautics and Space Administration (NASA)* Jul 2023

3] Two- Day Training session in MATLAB | *Aryabhatta Research Institute of Observational Sciences (ARIES)* Sep 2023

4] 5th LIGO Open Data Workshop | *LIGO Collaboration (Study Hub at IUCAA)* Jun 2022

ONLINE COURSES

1] Math Intuition for Quantum Mechanics and Quantum Field Theory | *Udemy - Dr. Pesaresi* Nov 2022

2] Introduction to active galaxies | *The Open University* Jun 2023

AWARDS AND PRIZES

1] The Greatest Astronomer Essay Prize | *Herschel Museum, Bath Royal Literary and Scientific Institution* Oct 2022

2] Mathematics Department Essay Competition Winner | *SVKT College, University of Pune* Apr 2022

3] 5th rank in International Astronomy and Physics Competition (IAPC) 2020 | *Physeeks Organization* Sep 2020

3] NASA Cassini Scientist for a Day Winner | *National Aeronautics and Space Administration (NASA)* Aug 2017

4] NASA Space Settlement Contest 2nd prize | *NASA - NSS (National Space Society)* May 2016

VOLUNTEERING AND OTHER EXPERIENCE

Volunteer and Observer | *Jyotirvidya Parisanstha : India's Oldest Amateur Astronomer's Association* Oct 2022 - Oct 2023

- Worked as a demonstrator and instructor during public star parties and sky-watching sessions on special occasions.
- Delivered talks on different topics in Astronomy for the general audience.
- Using an 11-inch reflector telescope to take regular photometric observations of variable stars and star clusters to be submitted to the American Association of Variable Star Observers (AAVSO).
- Conducted observations of other astronomical events like Asteroid Occultations and Eclipses.

Volunteer | *Youth Red Cross Society* Aug 2022

- Collaboration of the Youth Red Cross Society with the physics club of my college : AGC Physics Club for science outreach and popularization.
- Delivered educational talks and demonstrated simple experiments related to Physics for school students in the rural areas, orphanages and students from under-represented communities.

Observer | *International Astronomical Search Collaboration* Nov 2023 - Present

- Created my team : *Cosmic Patrollers* for the International Asteroid Search Campaign.
- Actively hunting asteroids in the image data provided by the 1.8-m Pan-STARRS telescope using *Astrometrica* software.

Organizer | *Abasaheb Garware College Physics Club* Sep 2020 - Sep 2023

- Responsible for organizing cultural festivals, departmental events and talks in college.
- Communicating and collaborating with different experts in Physics to organize talks.
- Delivered an introductory talk on gravitational waves titled : *"Surfing waves in the spacetime"* on the occasion of physics departmental festival : *Resonance 2023*.

WORK EXPERIENCE

Freelance Content Writer | *Fiverr & Upwork* Jul 2022 - Present

- Working as a freelance content writer in writing articles and essays for clients on freelancing platforms.
- Undertaken a project on classification of lunar features in a set of images.

IELTS™

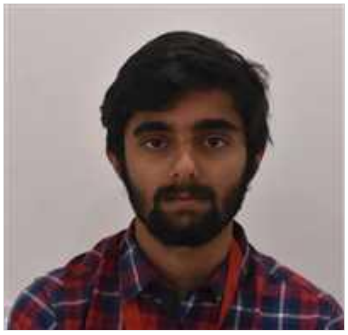
Test Report Form

ACADEMIC

NOTE *Admission to undergraduate and post graduate courses should be based on the ACADEMIC Reading and Writing Modules.*
*GENERAL TRAINING Reading and Writing Modules are **not** designed to test the full range of language skills required for academic purposes.*
*It is recommended that the candidate's language ability as indicated in this Test Report Form be re-assessed **after two years** from the date of the test.*
To find out more about IELTS, IELTS band scores and the CEFR levels, please visit ielts.org/scores

Centre Number	IA007	Date	01/NOV/2023	Candidate Number	515934

Candidate Details



Family Name	NAIK
First Name(s)	AJINKYA JAYANT
Candidate ID	W7637138

Date of Birth	13/01/2003	Sex (M/F)	M	Scheme Code	Private Candidate

Country or Region of Origin	
Country of Nationality	INDIA
First Language	MARATHI

Test Results

Listening	Reading	Writing	Speaking	Overall Band Score	CEFR Level
8.5	9.0	7.5	7.0	8.0	C1

Administrator Comments

Recognising organisations must verify this score at ielts.org/verify

Validation stamp

VALIDATION STAMP IELTS CAMBRIDGE ENGLISH/BRITISH COUNCIL/IDP

Date	04/11/2023	Test Report Form Number	23IA515934NAIA007A

BRITISH COUNCIL idp Cambridge Assessment English

Gates Cambridge reference for **Mr Ajinkya Jayant Naik**

MASt in Astrophysics

Referee Details

Name	Dr Pravin Dusane	**Job title**	Professor
Email	prd.agc@mespune.in	**Department**	Department of Physics
Phone	+91-9834765787	**Institution**	Abasaheb Garware College, Pune
Relationship	Course Instructor	**City**	Pune
Known for	January 2022 to present	**Country**	India

Reference

Gates ranking	Top 1% - Exceptional	**Gates group**	All students I have ever taught
Gates group size	800		

To the Gates Committee,
I am delighted to write this recommendation for Mr. Ajinkya Naik for the Gates Cambridge Scholarship. Ajinkya was enrolled for the Bachelor of Science program in Physics offered by our college for the academic years 2022-2023. I have taught him the courses of “Electrodynamics” and “Solid State Physics” for the duration of one year. Since the time I have known him, Ajinkya has always struck me as an outstanding student in terms of his academic, research and outreach achievements. He hails from a small town of Dhule in the state of Maharashtra, holding an unmatched passion and dedication for Astrophysics. He has always impressed me and the other faculty members of our department by his perseverance and remarkable achievements.
Ajinkya has managed to maintain a stellar academic record and scored a phenomenal SGPA of 9.91 out of 10 in the final semester exams, making him stand at the top of his class. He demonstrated utmost sincerity and punctuality during my lectures. I remember him always having an answer to the questions I posed during the lectures which is an indicator of his strong foundations and broad knowledge of Physics. In the laboratory sessions, he showed a quick learning pace and got along very easily with the equipment. Moreover, he would complete his experiments with the expected results and would go out of his way to help other students who were facing difficulties during the experiment. Ajinkya possesses good critical thinking and imaginative skills which are essential to pursue a career in Physics.
Research is something which has always excited Ajinkya. His work has been mainly concentrated in General Relativity, Gravitational Waves and Astrophysics. Mathematics is central to these subjects and as a result Ajinkya has greatly honed his abstract mathematical skills by studying them. By the time our coursework reached Quantum Mechanics and Special Relativity, he was already way ahead possessing a working understanding of some advanced concepts in quantum theory like the various interpretations of quantum mechanics, perturbation theory in quantum mechanics, quantum field theory, and of course in General Relativity. His bachelor’s thesis was one of a kind, based on an important phenomenon in Radio Astronomy: the 21 cm Hydrogen Line. Mr. Ajinkya dedicated immense efforts in taking the observations for this project on his own and achieved valuable results from them. His ability to draw logical inferences and conclusions from the data was truly remarkable. This quality puts him in a good position to undertake research in Astronomy. Recently, after graduating he was selected as a Visiting Student at the Aryabhatta Research Institute of Observational Sciences : a premier astronomical research institute ran by the government of India which also hosts the largest optical telescope in Asia. There he worked on gamma-ray bursts and acquired valuable coding skills in data analysis in High Energy Astrophysics. Mr. Ajinkya is an excellent writer and is able to write compelling pieces of articles and essays in Astrophysics. As an undergraduate student, he won many awards for his essays. For example, he was awarded a personal

virtual tour of the Herschel Museum of Astronomy in Bath for the "Greatest Astronomer Essay Prize" by the Bath Royal Literary and Scientific Institution. Mr. Ajinkya's essay titled: "From Calculus to Cosmology: The Journey of Mathematical Physics" also won him a cash award at the Department of Mathematics in SVKT College, University of Pune. He has the skill to break down complex concepts in Physics into a much simpler language which is easy to understand for the layman, something which he achieves by clever use of analogies and examples from daily life. Mr. Ajinkya also possesses good scientific writing skills which were seen from his detailed and coherent project report for the Bachelor's thesis.
His achievements are not only limited to academia and research. Ajinkya was an active member of the AGC Physics Club of our college and played an important role in organizing the departmental events. Due to his works and connections in the field, many talks delivered by guest experts in Astrophysics were made possible. This was very crucial for the younger students at our college who are willing to pursue a career in Astrophysics. He also mentored these juniors and provided them with valuable guidance for scoring internships and research experience in Astrophysics. “Surfing Waves in Spacetime” was a very engaging talk delivered by him on the account of our yearly departmental festival: *Resonance 2023.*
Ajinkya believes that Astronomy is one of the most important fields in Science which gives individuals a new perspective on life and on the vastness of Universe. This subject is vastly under-appreciated in India especially by the older age groups and in the rural regions, which is why he has embarked on a mission to educate the general public about the captivating subject.
His contributions in Astronomy outreach through the amateur astronomy club: Jyotirvidya Parisanstha (JVP) are unprecedented. The association is the oldest amateur astronomer’s association established by some of the most prominent astronomers of India in 1944. Ajinkya has also mentored bachelor’s students for their bachelor's thesis in using the 11-inch reflector telescope in the Kesariwada Observatory ran by JVP. He himself put in substantial efforts in handling and maintaining this observatory to take photometric observations of variable stars as well as observations of asteroid occultations. This data is submitted to the American Association of Variable Star Observers (AAVSO) and also made available for public use.
Recently, he was selected as a Junior Outreach Coordinator by the Inter-University Centre for Astronomy & Astrophysics stationed at the LIGO-India site. His responsibilities for this position are immense and include conducting outreach activities in the schools and colleges around the rural region of LIGO-India site, coordinating and maintaining relations with LIGO-India stakeholders, and documenting the stages in the development of LIGO-India. This experience will build his leadership and management skills.
Ajinkya is a bright and ambitious individual with many dreams in his eyes. The Gates Cambridge Scholarship will aid him in fulfilling his dreams of pursuing a career in Astrophysics. As someone who grew up in a rural village, I have recognized the unlimited potential that Ajinkya holds and have no doubt that Ajinkya will exceed the expectations held from him in the field of academia and research. He will make a valuable addition to the Gates Cambridge Scholar’s community and I strongly recommend him for the same.
-Regards,
P.R. Dusane.