



MANIPAL
ACADEMY of HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

Manipal Center for Natural Sciences
Center of Excellence

Admission to iPh.D. Program

(Integrated M.Sc. - Ph.D.) in **Physics**

Manipal Centre for Natural Sciences (MCNS) is a “Centre of Excellence” under Manipal Academy of Higher Education dedicated to the pursuit of fundamental research. The Integrated MSc-PhD programme in Physics at Manipal Centre for Natural Sciences, MAHE is now open for highly meritorious students with motivation towards fundamental research in the frontier areas of Natural Sciences.

For the current academic year, **Physics discipline is offered. All students with a Bachelor’s degrees (B.Sc/B.Tech.) are eligible to apply. For further queries, please contact :**

☎ Phone: 0820 292 3571

✉ Email: office.mcns@manipal.edu



Apply:

<https://manipal.edu/mcns-manipal/program-list2/Integrated-PhD.html>

Or scan the QR Code

Highlights

Relevant details regarding the Program.

Duration: 5 Years (Including M.Sc.)

Specialization:

- Astrophysics
- Particle Physics

Program Curriculum:

1st & 2nd Semesters :
Essential Courses for M.Sc.

3rd & 4th Semesters : Research Project

Continue to Ph.D. :

On successful completion of four semesters, with appropriate grade and excellent research performance, student can continue as Ph.D. Scholars under the guidance of MCNS Faculty with Dr. T.M.A. Pai Fellowship for 3 years.

Exit Option:

After 4th Semester, exit the program with **M.Sc. By Research** degree

Course Commences: August 2025

How to Apply for iPh.D. at MCNS, Manipal

1. Scan the QR Code or Visit:

<https://www.manipal.edu/mcns-manipal/program-list2/Integrated-PhD.html>

Click the **Apply Now** button. (See Image)

2. In the next page, fill in the details as follows :

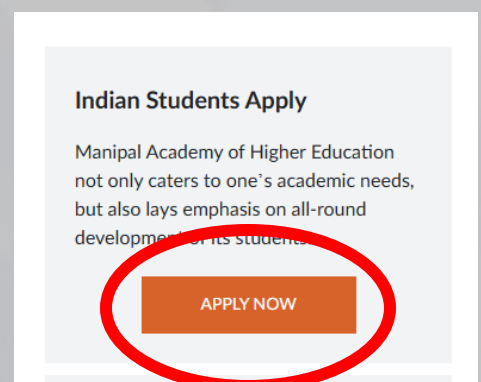
Enter your details

Program Level Applying For: **Postgraduation – PG**

Stream – **Basic & Applied Sciences**

Program – **Integrated M.Sc. – Ph.D.**

Select Campus / Location - **Manipal**

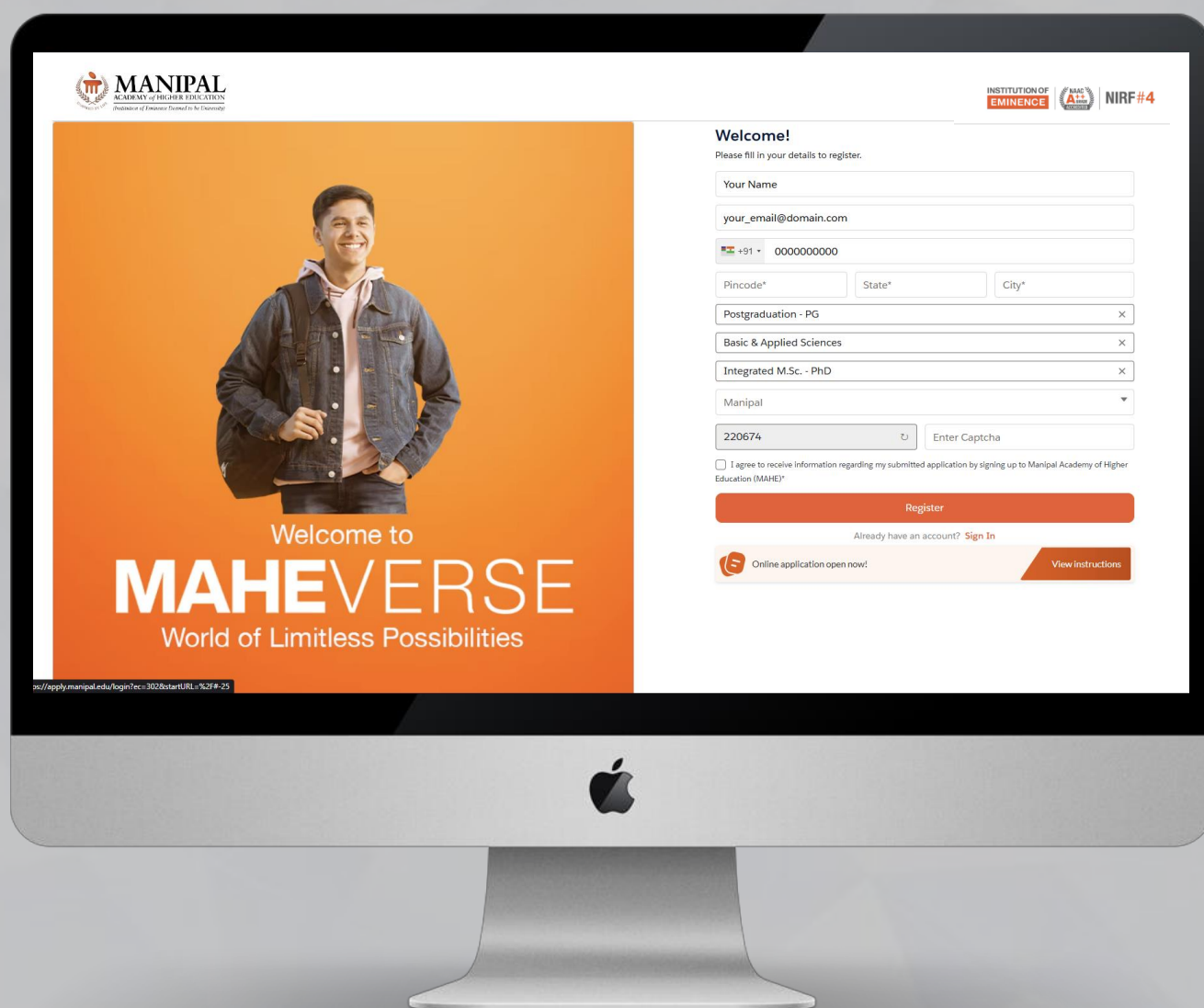


Upon submission, you will be directed to the [payments page](#) for completion of the application.

You will receive an acknowledgement with an [application number](#) for future reference

All candidates are [required to qualify a Departmental Test/Interview](#)

Test/Interview dates will be communicated later.



MANIPAL CENTRE FOR NATURAL SCIENCES

[MCNS] Centre of Excellence



Manipal Academy of Higher Education (MAHE), had created the Manipal Centre for Natural Sciences (MCNS) in the year 2012, primarily to nurture fundamental research in the Natural Sciences (which includes Astronomy and Astrophysics, Particle Physics, Computational Chemistry, and Evolutionary Biology). In the year 2013, the MCNS was recognized as a 'Centre of Excellence' under MAHE.

Since inception MCNS is an “all-research” Centre, and it has been striving to promote fundamental research in the forefront areas of natural sciences by encouraging independent and creative thoughts essential for scientific pursuit. The Centre presently has both academic and research programs.

Academics and Research

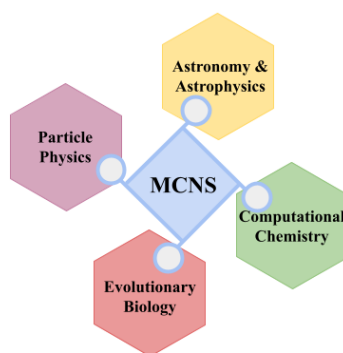
MCNS has a regular Ph.D. program, from its inception. This is open to students who have completed their M.Sc. degree with excellent academic record and propose to do research in a contemporary topic in any area of science being pursued in the Center. In this scheme, it is necessary for the applicant to defend his/her proposal in front of a panel of experts and obtain the recommendation for admission.

Under this program, fellowship is not assured but, one can avail of either Dr. T.M.A. Pai Fellowship (offered by MAHE on a competitive basis) or by clearing NET. In some cases, the scholar may be supported by the mentoring faculty under an externally sponsored project.

From the AY 2021-22, MCNS is offering an ‘Integrated MSc-Ph.D. program, in addition to the existing regular Ph.D. program. The Integrated Ph.D. program aims to attract talented and dedicated Bachelor’s degree holders with a keen sense of scientific enquiry and motivation to pursue high priority research in frontier areas of Basic Sciences. This program is offered on a full-time basis for a minimum period of five years. The first 2 semesters of the program would cover the essential subjects at the Master’s level, and specific courses mandatory for a Ph.D. The 3rd and the 4th semesters would be devoted entirely for a research project work at the Master’s level. The 5th semester and beyond would be for research towards the Ph.D. Degree. Proceeding to the 5th semester is based on the candidate’s performance and on the recommendation from the academic advisory committee (AAC).

Students not recommended to, or not keen to continue for the Ph.D. program, would exit after the 4th semester with an M.Sc. by Research degree, subject to eligibility.

A variety of elective courses are offered in the program. The courses are so designed by experts as to facilitate strong foundation in the selected discipline, as well as to incorporate inter-disciplinary elements to encourage cross-pollination of ideas and concepts. Laboratory experiments are devised to enhance concept-based learning and a variety of scientific skills. The academic program is tightly integrated with computation, laboratory and fieldwork. Invited seminars and talks by national and international experts are regular events at the Centre.



Infrastructure

High Performance Computer Cluster “Shakti”

A dedicated high-performance computer cluster “Shakti” with fully parallel architecture is available for use by faculty and advanced level students at MCNS.

Library

The Centre has a dedicated full-service library to support education and research in the natural sciences.

Laboratories

MCNS currently has many research and teaching laboratories. Research laboratories include a neutron source lab, HPGe lab, PG lab, Synthetic & Material Chemistry, Evolutionary Biology, Palynology lab, and a Computing lab. In addition, an

astrophysics set-up with a 12-inch telescope and peripherals are available. An indigenously designed and fabricated table-top accelerator is available at the Centre for teaching and research. This equipment was designed and built, in technical collaboration with the Inter University Accelerator Centre (IUAC), New Delhi.

Dr. T.M.A. Pai Planetarium

The Carl Zeiss sky telescope within the Sky Theatre provides a year-round live sky experience to budding astronomers of all ages. It is also used as a teaching aid and astronomy lab for students and lifelong learners. This is the only planetarium in the country to co-exist with an active astrophysics research group.

Daily shows at the 70-seater Sky Theatre and special events are conducted on a not-for-profit basis. Four new shows were introduced in the previous year. The planetarium also organises a variety of special interest events to mark important occasions in science including new discoveries.

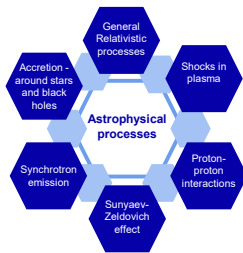
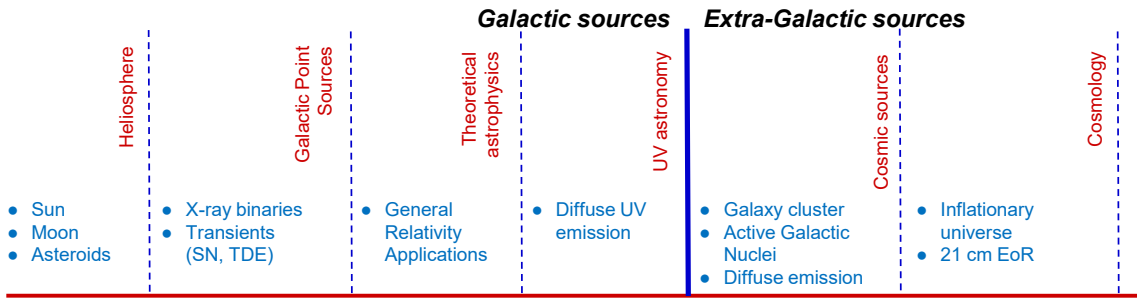
Auditorium

A 100+ seater auditorium with audio visual infrastructure is available for special events, talks and seminars.

Advantages

Research at MCNS is in niche, emerging and inter-disciplinary areas of science, which makes the Centre a unique research destination. The Post-Doctoral program, is specially structured to nurture independence and creativity in research, and collaborates with similar programs abroad, to encourage exchange and mobility. MCNS provides a stimulating environment towards a future scientific leadership in the emerging fields, by encouraging blue sky research in all the branches of Natural Sciences. MCNS is also recognised as one of the Inter- University Centre for Astronomy and Astrophysics (IUCAA) for Astronomy research and development.

Astrophysics Research @ Manipal Centre for Natural Sciences



Research areas

- Star formation
- Dust in our solar system
- Chemistry of lunar soil
- Sun-Earth connection
- Solar chromospheric processes
- Instrumentation - Aditya L1, XpoSat, WiSpex
- AGN outbursts
- Accretion / jet
- Black hole/Singularity
- Inflation, Primordial black holes, Dark matter
- Relativistic astrophysics
- Cosmic structures and magnetic fields

Other fundamental research @ Manipal Centre for Natural Sciences

Nuclear and Particle Physics

- String Theory and Quantum Gravity
- Neutrino Physics
- Phenomenology of Particle Physics

Computational Chemistry

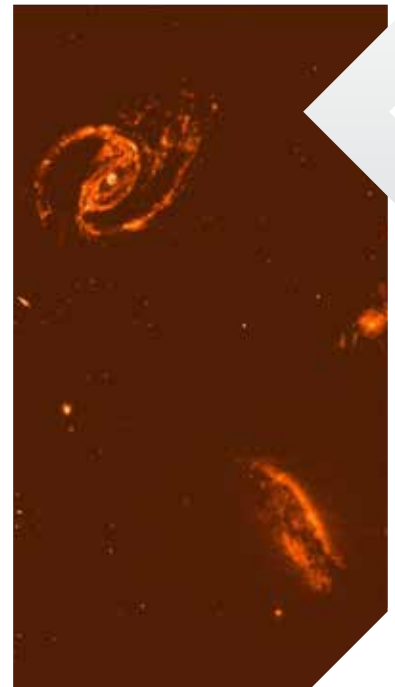
- Spin transport through single molecule
- Spin dynamics of molecules
- Molecular qubit
- Magnetism in molecules

Ecology & Evolutionary Biology

- Biodiversity and Conservation
- Palaeoecology
- Phylogenetics
- Biogeography

Research Excellence in Numbers

No. of Research Scholars at the PhD level	21
No. of PhDs awarded	4
Total no. of Journal publications	~210
Sponsored projects (Completed/ongoing)	> 20
Selected Workshops/Schools (last 10 years)	
1. National School on fundamentals of Space Radiation for scientists, Engineers and Space entrepreneurs 2024	
2. 9th Regional Astronomy Meet (RAM) - 2024 (National)	
3. International Symposium on Nuclear Astrophysics (ISNA) - 2023	
4. Bringing Astronomy: Start a data-driven journey – 2023 (National)	
5. Solar Flare Studies using Aditya-L1 – 2022 (National)	
6. School on 'Invitation to Particle Cosmology' – 2018	
7. School on 'Observing Universe with Astro Sat' – 2018	
8. Math days in Manipal-Workshop on Algebraic Geometry – 2015	
9. School on Algebraic Surfaces – 2015	
10. School on 'Recent Trends in Astrophysics and Cosmology' – 2014	
SummerResearch InternshipProgram (annual)	10



Ph.D.

Duration

Minimum 3.5 Years (Post M.Sc.)

Eligibility Criteria & Admission Process

Refer Section 2

Course Fees, Hostel Fees, Refund Rules

Refer Section 3

Last date to apply and Commencement of Classes:

Refer <https://manipal.edu/datestoremember>

Program Description

This regular Ph.D. program is open for students with Master's degree, highly meritorious, and motivated towards fundamental research in Natural Sciences such as physics, chemistry, evolutionary and developmental biology.



MCNS faculty working in a class 100 clean room at ISRO Bangalore: developing SUIT onboard Aditya-L1

Integrated MSc-Ph.D.

Duration

5 years (MSc 2 year + PhD 3 year)

Eligibility Criteria & Admission Process

Refer Section 2

Course Fees, Hostel Fees, Refund Rules

Refer Section 3

Last date to apply and Commencement of Classes:

Refer <https://manipal.edu/datestoremember>

Program Description

This Integrated MSc-Ph.D. program is open for students with Bachelor's degree, highly meritorious, and motivated towards fundamental research in Physics, with a choice of specialization in (i) Astrophysics (ii) Nuclear & Particle Physics. A student in this program, would complete the courses mandatory for a Ph.D., along with the course essential for an MSc., during the first two semesters, and also acquire ample research experience by working on a research project, during the 3rd and the 4th semesters. Ph.D. level work begins at the 5th semester. Students with good academic performance and who also clear the internal review, move on to the Ph.D program. Such a student would be more equipped, than a regular MSc student, while beginning to do Ph.D. level work. However, successful completion of four semesters also provides an option to exit the program with a degree M.Sc. by research in Physics.

Student activities

Students at MCNS are encouraged to participate in a host of extra curricular scientific and academic activities. Three student clubs namely (i) Nature Club (nature walks, talks and observations) (ii) Movie Club (screening of short videos of scientific interest) and (iii) Reading Club (reading and discussion on a topical paper from a leading scientific journal) meet on a monthly basis, and are entirely managed by research scholars, to convey the excitement of new ideas and discoveries while stimulating scientific debate and discussion.

Collaborations & Partnerships

Researchers at MCNS derive benefit from continuous interaction with eminent scientists of national and international repute. Active formal and informal collaborations with well-known academic and research institutions, and renowned academicians provide exceptional opportunities to explore new research directions.

