
✧ ICTP, PWF Project ✧

Sherubtse College, Bhutan, 2024

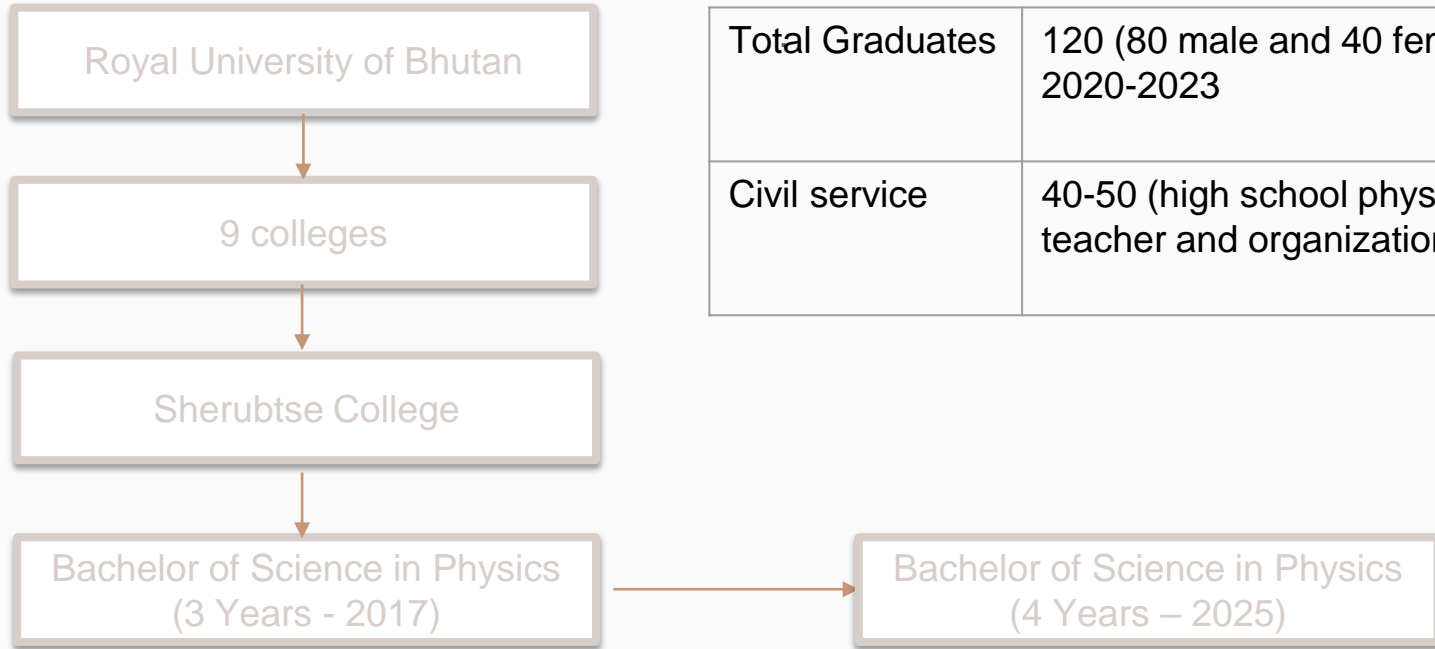


Location





Current Situation for Physics



Total Graduates	120 (80 male and 40 female) from 2020-2023
Civil service	40-50 (high school physics teacher and organization)



Reality of Physics in Bhutan

- No research institute or industry.
- Many physics graduates find themselves working in jobs that do not fully utilize their skills and knowledge.
- Majority of graduates left the country
- Physics graduates are UNDERVALUED.





Project Organized

ICTP, PWF in collaboration with University of Sussex and Sherubtse College, Royal University of Bhutan organized 5 days workshop on “Symmetries, Data Science and AI for Physicists” in Sherubtse College from 25th – 29th March, 2024.

Participants

89 students and 6 faculty members of Physical Science Department.





Team Members



Dr. Kate Shaw
ICTP, PWF and
University of Sussex



Prof Andrea Banfi
University of Sussex



Dr. Mick Taylor
University of Sussex



Mon Bahadur Ghalley
Royal University of Bhutan



Goals

- Gain a profound understanding of key physics principles and theories through interactive sessions, demonstrations, and practical applications.
- Develop critical thinking and problem-solving skills by actively engaging in physics problem-solving exercises and collaborative activities.
- Cultivate a curiosity-driven mindset by exploring intriguing phenomena in physics, encouraging a lifelong passion for learning and discovery.
- Encourage teamwork and collaboration among participants to solve complex physics challenges, fostering a spirit of cooperation and shared learning.
- Improve communication skills by articulating and discussing physics concepts, theories, and findings with peers and facilitators.

Schedule



Morning Session
Lectures



Afternoon Session
Hands-On session



Problem Solving session
Special session for 3rd Year
Physics Students



Group Discussion and Presentation by the Students at the end





Feedbacks

“It was very interesting and I got to learn a lot from the professors. It made my interest in physics even more greater and made me want to work hard.”

“The workshop was very interesting since we learned the deep core of physics. And it was fascinating for us to attend this workshop. We got many knowledge and ideas about the particle physics, data science, and symmetries topic. So, it was very good opportunity to attend this workshop.”

“Advanced..... it was interactive session. “

“Valuable for future information and good that we had golden opportunity to deal with international professionals”

“We have learned that learning physics have got lost of scope in future.”

“The physics workshop was an enlightened and well-organized event that provided a deep dive into contemporary physics topics and hands-on experiences. The workshop was structured to cater to both theoretical understanding and practical applications, making it an enriching experience for all participants.”



“It was so helpful for being a physics student as this workshop gave us an opportunity to learn the things that we will not learn while perusing the degree and I would love to see this workshop again happening with my junior to come as well.”

“I found the workshop to be incredibly insightful and engaging. The facilitator's expertise and passion for the subject matter were evident throughout, making the content both informative and enjoyable. The interactive activities were particularly helpful in reinforcing key concepts and promoting active participation. Overall, it was a valuable learning experience, and I look forward to applying the knowledge gained in my personal and professional endeavors. Thank you for organizing such a worthwhile workshop.”

“The workshop provided us about the overall idea of how the world is drastically shifting to AI generation and what AI is worth of. Moreover it provided an insight to how new particles are detected using LHC.”

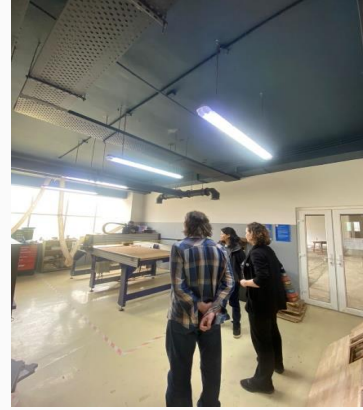


Goals and Achievements!!

- Gain a profound understanding of key physics principles and theories through interactive sessions, demonstrations, and practical applications. ✓
- Develop critical thinking and problem-solving skills by actively engaging in physics problem-solving exercises and collaborative activities. ✓
- Cultivate a curiosity-driven mindset by exploring intriguing phenomena in physics, encouraging a lifelong passion for learning and discovery. ✓
- Encourage teamwork and collaboration among participants to solve complex physics challenges, fostering a spirit of cooperation and shared learning. ✓
- Improve communication skills by articulating and discussing physics concepts, theories, and findings with peers and facilitators. ✓
- **UNEXPECTED OUTCOME: Sense of feeling valued!**



Outcome.



Visit to Jigme Namgyel Wangchuck SuperFab, March, 2024

Students of Sherubtse College will start their internship from December, 2024 for a period of 2 months!



Outcome

Introduced Advanced Computational Physics Module which will start in 2025

Year	Semester	Module 1	Module 2	Module 3	Module 4	Module 5	Classification
1	1	Foundation of Python Programming	Academic Research Skills	Dzongkhag Communication-1	Introductory Mathematics	Philosophy of Science	Common Module
	2	Data Analytics with Python	Dzongkha Communication	Introductory Life Science	Introductory Physics	Introductory Chemistry	
2	1	Essential Mathematics for Physics	Classical Mechanics	Vibrations and Waves	Electricity and Magnetism	Elective I	Basic Physics
	2	Thermodynamics	Optics	Elementary Electronics	Modern Physics	Elective II	
3	1	Quantum Physics	Atomic Physics	Computational Physics	Physics of Renewable Energy	Elective III	Applied Physics
	2	Statistical Physics	Nuclear Physics	Environmental Physics	Intermediate Electronics	Elective IV	
4	1	Quantum Computing	Nano Physics	Advanced Computational Physics	Computer Aided Physics Inquiry	Elective V	Higher Physics
	2	Capstone Project Phase I- Planning and Research Capstone Project Phase II- Execution and Analysis					



Future Plans

- Capacity Building.
- Joint Research Projects.
- Students and faculty exchange programs.
- Mentorship for faculty and students to do research.
- Knowledge Sharing and Dissemination.

Thank You To ICTP,PWF!

