

# ICTP Physics Without Frontiers Physics For Bangladesh

## School on Mathematics for Physics 1: Operators on Hilbert Spaces

1 May - 5 July, 2026

This is a gentle introduction to unbounded operators on Hilbert spaces pertinent to quantum mechanics. Our starting point will be pointing out the differences between operators on finite-dimensional and infinite-dimensional Hilbert spaces, and to understand why the later is essential to formulate quantum mechanics in a mathematically rigorous fashion. We will begin with basics of unbounded operators on Hilbert spaces and rigged Hilbert spaces in order to explain the standard Heisenberg's matrix mechanics and Dirac's bra-ket formalisms. Our aim is to comprehend a quantum mechanical simple harmonic oscillator and its spectrum from an operator theoretic viewpoint. A rudimentary background in linear algebra is assumed albeit a few topics will be recalled in due course in order to motivate the analysis in an infinite-dimensional Hilbert space setting.

### Instructor:

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### Organizers:

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**Application Deadline: 25 April 2026**

<https://physicsforbangladesh.org/schools/math-physics-1/>

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