MATH 4810/5810 Hilbert Spaces
Course Projects

August 2024

Course Instructor: Dr. Markus Pflaum

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1. Foundations of measure and integration theory (Trevor)
2. The Theorem of Stone–Weierstraß (Ari)
3. The Stern–Gerlach experiment (Gregory, Wed Aug 21, 9:00am)
4. The experiments by Alain Aspect et al. which confirmed Bohr's interpretation of quantum mechanics (Souparna, Thu Aug 22, 9:20am)
5. Representations of $\mathfrak{su}(2, \mathbb{C})$ (Taylor, Wed Aug 21, 9:40am)
6. Coherent states (Austin, Wed Aug 21, 10:00am)
7. Wigner's theorem (Brendon, Wed Aug 21, 10:40am)
8. Bargmann's theorem (Jonathan, Wed Aug 21, 11:00am)
9. Pauli's derivation of the spectrum of the hydrogen atom (Parker, Wed Aug 21, 11:20am)
10. Fourier analysis in Hilbert spaces: Fourier series and the Legendre polynomials (Aqua, Wed Aug 21, 11:40am)
11. The spin in quantum mechanics (Angel, Thu Aug 22, 9:00am)
12. The Dirac Operator (Joshua, Thu Aug 22, 9:20am)
13. The Born–Oppenheimer approximation (Patrick, Thu Aug 22, 9:40am)
14. The geometric phase in quantum mechanics (Magnus, Thu Aug 22, 10:00am)
15. Quantum entanglement (Kenji, Thu Aug 22, 10:20am)
16. Quantum Error Correction on Infinite-Dimensional Hilbert Spaces (Kanishka, Thu Aug 22, 10:40am)
17. Foundations of Quantum Computing (Carey, Thu Aug 22, 11:00am)
18. Quantum transistors and quantum interference (Phoebe, Thu Aug 22, 11:20am)