



Contribution ID: 118

Type: **Presentations in Wroclaw**

Understanding the relation between classical and quantum mechanics: prospects for undergraduate teaching

Thursday 16 December 2021 12:00 (20 minutes)

Classical and quantum mechanics are two very different theories, each one describing the world within its own range of validity. According to Planck's version of the correspondence principle, classical mechanics is recovered when the limit in which Planck's constant h goes to zero is taken, while within Bohr's version the limit of large quantum numbers is taken. However, despite what suggested by many textbooks, the relation between the two theories is much more complex to state and understand. Here we deal with this issue by analysing some key examples. Implications for quantum mechanics teaching at undergraduate level are carefully discussed.

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Session Classification: Parallel 10 - Wroclaw

Track Classification: 20. Contemporary physics and modern physics in schools and universities