

# **TUTORIAL: Scientific computing and the development of parallel algorithms using the Julia programming language**

*Wednesday 26 November 2025 17:35 (1 hour)*

This master class demonstrates the potential of the Julia programming language for exploring multiparameter models described by systems of nonlinear differential equations. A model of a point  $\varphi_0$  Josephson junction of the superconductor-ferromagnet-superconductor type with a direct relationship between the magnetic moment and the Josephson current is considered as an example. A methodology for preparing a problem for calculations, the specifics of numerically solving systems of equations, and the capabilities of the Julia language for implementing parallel computations for calculating magnetic moment flip domains over a wide range of parameters are presented.

**Author:** BASHASHIN, Maksim (Laboratory of Information Technologies, JINR)

**Presenters:** BASHASHIN, Maksim (Laboratory of Information Technologies, JINR); MATVEYEV, Mikhail (JINR)