Oleg Popov Research Statement:
My current research focuses on model building Beyond Standart Model to solve the following problems in High Energy Physics:

- origin of Neutrino mass
- origin of Dark Matter
- the connection between the origin of neutrino masses and the existence of Dark Mater (DM)
- the origin of the mechanism that generates PMNS (Pontecorvo−Maki−Nakagawa−Sakata) matrix and Flavour structure of leptons which involves finite and continues groups to achieve this
- Phenomenology of the BSM models, their testability and signatures at the LHC
- unificaion of Electroweak and Strong Forces at the GUT scale in the light of SM extensions to solve problems like Neutrino Masses, Flavour Anomalies, Vacuum stability, etc

In my recent projects I have been involved in the study of BSM models to generate Neutrino masses from the Scotogentic ("Scoto" from Greek meaning Darkness) Radiative Inverse See−Saw mechanism with a DM canditate and a Flavour structure to generate Neutrino mixing pattern. My other project involves the study of the phenomenology and testability of type II radiative See−Saw Model of Neutrino Mass with Dark Matter. One of the recent projects involves the extention of the MSSM (Minimal Super Symmetric Model) to explain recent LHC anomalies. Gauge B-L extension of the SM to generate radiative Neutrino masses through a multiparticle DM. One of my most recent projects focuses on the generalized study of mechanisms to generate Naturally small Dirac Neutrino masses. This project also inculdes the study of new two loop generation of Neutrino mass through a mediation of gauge bosons with a radiative left-right gauge boson mixing with a Scotogenic extension also presented in the paper. Recently I have also been studying BSM model including d_R type leptoquark to generate a radiative Neutrino mass with a Flavour strucure as well as generate gauge coupling unification and vacuum stability at the GUT scale.

In my projects I also use computer phenomenology tools like FeynRules, FeynArts, CalcHEP, MadGraph, SARAH, SPHENO, etc to study BSM models and their phenomenology.

Besides my focus of interest mentioned above, my current and future interests also include Hierarchy problem, Self Interacting Dark Matter (SIDM) models and their phenomenology with a possible connections to the origin of Neutrino mass, Flavour structure of leptons, gauge coupling unification in SUSY and non SUSY models, origin and production mechanism of DM and neutrinos during and after Inflation.

In the light of my research interests and goals I would be forever grateful if I could continue my research at the FermiLab's Theoretical Physics Group. Hopefuly I can get an oportunity to work and do my future research at Fermilab.