Abstract: In recent years there have been substantial developments in the theory of second order elliptic operators with unbounded coefficients, see for example [1], [2], [3] and the references therein.

In this talk I will discuss various recent results related to the following second-order elliptic operator

\[ A = q(x)\Delta + F(x) \cdot \nabla_x - V(x) \]

defined in the whole \( \mathbb{R}^N \). This kind of operators arise as a model in many field of science, especially in stochastic analysis (Ornstein-Uhlenbeck operators), mathematical finance (Black-Scholes equation and Cox-Ingersoll-Ross model), in physics (in non-relativistic quantum mechanics the Schrödinger operator). In particular, we are interested in studying quantitative and qualitative properties in \( L^p(\mathbb{R}^N) \), \( 1 < p < \infty \), of the elliptic operator \( A \) where \( q(x) = (1 + |x|^\alpha) \), and \( F(x) = bx^{\alpha-2}x \).

References

