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Mathematics is a Science of Life

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This talk is dedicated to Alexander Antoniouk, the young mathematician who passed away untimely of a heavy incurable disease in his most productive age. Despite his young age he was a man of great erudition and remarkable way of thinking. Although his years were short, he succeeded in many areas of mathematics, like:

- Nonlinear analysis and theory of PDE;

- Theory of stochastic differential equations in finite- and infinite-dimensional spaces;

- Stochastic analysis (Malliavin calculus) on the Riemannian manifolds, where he introduced new type of derivative and constructed a corresponding analog of Malliavin derivative;

He also worked in the field of Statistical Mechanics and has constructed a new model of Statistical mechanics with non-quadratic interaction. He dreamed to construct the Unified Field theory and for that he mastered his skills as a mathematician.

He had an idea of strict description of relativistic Brownian motion noting that in relativistic theory velocity should be bounded, however, in the modern construction of stochastic processes the trajectory of each Brownian particle is nowhere differentiable, which means that its velocity is infinite.

Also he had bright ideas in fields of Hamilton-Jacobi equations, Quantum Mechanics and Quantum Stochastic differential equations, but he had not time to implement them. The report will concern some of his results.