Deninger's programme: a motivation for developing new mathematics

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Deninger started in the 90's to develop an infinite dimensional cohomological formalism in order to explain the expected conjectures for the arithmetic zeta functions. He conjectured that these (infinite dimensional) cohomology groups should be constructed as leafwise cohomology groups on suitable foliated spaces. These foliated spaces are not known to exist and maybe they do not exist at all. But it turns out that, having in mind this motivation, one can develop interesting new mathematics in differential geometry (i.e. outside number theory).

We shall review in some details the basic ideas underlying the origin of Deninger's program and at the end describe briefly new results, motivated by it, in particular by AlvarezLopez-Kordyukov-L in differential geometry.

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