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Research field: Number theory
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Present research:

An overconvergent isocrystal is a kind of p-adic differential equation defined on an algebraic variety of characteristic $p > 0$, which is a p-adic analogue of a local system or an integrable connection on an algebraic variety over the field of complex numbers. Also, there is a notion of rigid cohomology with overconvergent isocrystal as coefficient, which is a p-adic analogue of the notion of singular cohomology with local system as coeffient or that of de Rham cohomology with integrable connection as coeffient. I study the properties of overconvergent isocrystals and rigid cohomologies, using (log) algebraic geometry and (log) p-adic analytic geometry. Also, I have studied the properties of several p-adic cohomologies (crystalline cohomology, log convergent cohomology and log Hodge-Witt cohomology) and the crystalline fundamental group which is a non-commutative version of crystalline cohomology.

Notice for the students:

If you would like to be a student of mine, you should have enough knowledge on basic facts on group theory, ring theory and field theory. Also, it is better to learn number theory of local field and number field, theory of schemes and theory of sheaves and cohomologies. Also, it is better to think in which field in arithmetic geometry you would like to study in the future. I think it is important to study now on one hand and to think on the future plan on the other hand. Arithmetic geometry is a field in which many mathematical knowledge is needed. So it is encouraged to study the things in which you are interested as much as possible.