今後の研究計画（英訳）

My longer-term goals are focused on the establishment of a higher and quantized version of the classical Teichmuller theory in positive characteristic or over p-adic local fields.

A series of my past works has demonstrated a nontrivial interaction among various areas in mathemetics by means of certain methods in the p-adic Teichmuller theory developed by S. Mochizuki. In particular, the explicit formula for the number of dormant indigenous bundles (Joshi's conjecture) obtained myself presented some identities and explicit computations of invariants associated with purely combinatorial objects. So it will have a great importance to generalize, in suitable directions, my past work concerning the p-adic Teichmuller theory.

More concretely, I plan to investigate the geometry of the moduli stack classifying quantized G-opers for an arbitrary reductive algebraic group G in arithmetic context. Here, a (quantized) G-oper is an integrable G-torsor over an algebraic curve satisfying certain conditions, which may be thought of as a natural generalization of an indigenous bundle, and has played a large role in the geometric Langlands problem. My coming research will be devoted to investigate the algebro-geometric nature of the various moduli stacks classifying quantized G-opers satisfying certain arithmetic conditions on stable log curves over fields of positive characteristic or p-adic local fields. (I have already proceeded and completed some detailed discussions and written papers. cf. [W7])

Also, throughout my past and incoming research, I propose a new perspective, without being bound by existing fields of mathematics, in the algebraic geometry of positive characteristic. In fact, I am aware of an importance of the perspective that algebraic curves equipped with a dormant indigenous bundle should be thought of a fundamental geometric objects when one execute certain analytic discussions in positive characteristic. For

example, by dealing with such objects, one may develop an analogous theory (in positive characteristic) of the exact WKB analysis, which is a new treatment of WKB solutions of 1-dimensional Schrodinger equations based upon the Borel resummation technique.