The mathematical works of Shigefumi Mori

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Shigefumi Mori has been one of the most influential mathematicians of the past three decades. A proper survey of his achievements and influence—showing how his work fits in with that of his contemporaries and detailing the results proved by other mathematicians following the paths he laid out—would be a complete history of higher dimensional birational geometry, and thus far beyond the scope of this short summary.

The following overview groups his works according to themes rather than focusing on his main theorems, with the aim of laying out the fundamental ideas more clearly. However, this approach does result in some seemingly odd choices: one of the main topics (Mori's program) does not correspond to any of his publications and several important papers are omitted or mentioned only in passing.

I have had the privilege of knowing and working with Shigefumi Mori since 1983. This collaboration has been a fundamental influence on my mathematical point of view and development, thus I cannot pretend to offer an unbiased survey of Mori's contributions to algebraic geometry. Those who prefer to form their own opinion would be well-rewarded by reading his papers, especially [1] and [2]. These fundamentally important and enjoyable works illustrate the depth and originality of his ideas, as well as the clarity and precision of his writing.

§ **Bend-and-break**

It is a rare pleasure in mathematics to be surprised by a theorem whose proof is simple, yet its applications are profound. *Bend-and-break* is among them. The proof consists of three observations.

(i) Let C be a smooth, projective curve and $f_t : C \to X$ a 1-parameter family of non-constant morphisms. If the genus of C is ≥ 1