

## Parabolic power concavity and parabolic boundary value problems

Kazuhiro Ishige

Mathematical Institute, Tohoku University, Japan

ishige@math.tohoku.ac.jp

This talk is concerned with power concavity properties of the solution to the parabolic boundary value problem

$$(P) \quad \begin{cases} \partial_t u = \Delta u + f(x, t, u, \nabla u) & \text{in } \Omega \times (0, \infty), \\ u(x, t) = 0 & \text{on } \partial\Omega \times (0, \infty), \\ u(x, 0) = 0 & \text{in } \Omega, \end{cases}$$

where  $\Omega$  is a bounded convex domain in  $\mathbf{R}^n$  and  $f$  is a nonnegative continuous function on  $\Omega \times (0, \infty) \times \mathbf{R} \times \mathbf{R}^n$ . We give a sufficient condition for the solution of (P) to be parabolically power concave in  $\overline{\Omega} \times [0, \infty)$ . This is a joint work with Professor Paolo Salani.

### References

- [1] *A. U. Kennington*: Power concavity and boundary value problems. *Indiana Univ. Math. J.* *34* (1985), 687–704.
- [2] *Y. K. Ishige, P. Salani*: Parabolic quasi-concavity for solutions to parabolic problems in convex rings. *Math. Nachr.* *283* (2010), 1526–1548.